

FIG. 1A



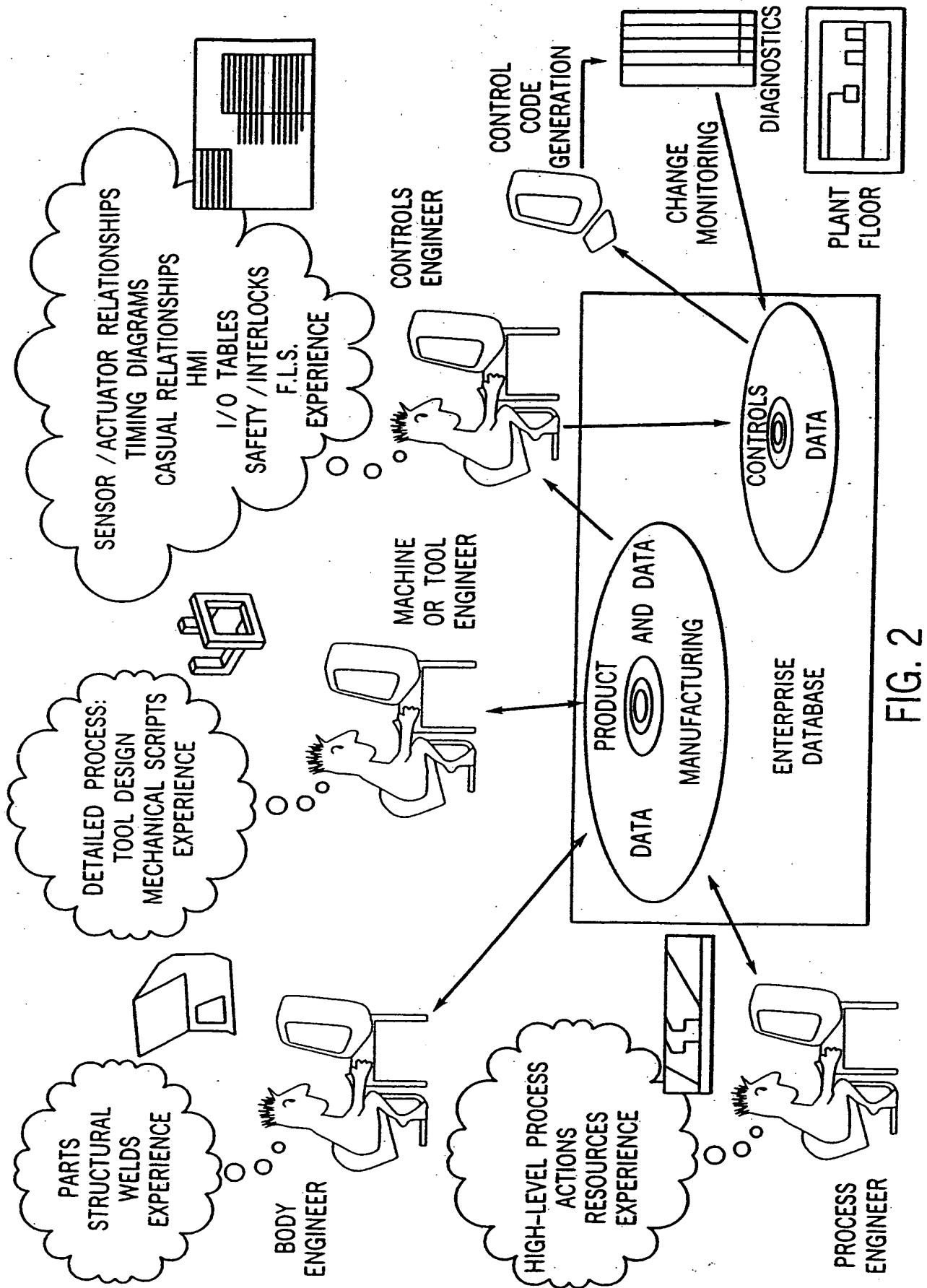


FIG. 2

Microsoft Access

File Edit View Insert Format Records Tools Window Help

The machine resource database has two parts: A catalog or library that describes control assemblies, configurations of components that perform distinct control functions, that can be used in a machine resource description and a set of tables used to

Control Assemblies with Physical Components

Total number of catalog entries with Physical Components

Previous Next

Control AssemblyCatalogID

safe-bulkheadclamp

This is labeled as "safe" clamp because it needs to have two air valves

The following is a list of the physical components that make up a control assembly of this type:

Element Type	Subtype	Role	Manufacturer	Max	Min
airvalve	doublesolenoid	main control	Numatics	1	1
airvalve	singlesolenoid	safety valve	Numatics	1	1
aircylinder	Cylinder	air-motion coverter	Namco	9999	1
clampbody	none	clamp	9999	9999	1
*	none		0	0	number

To see the I/O associated with a component, click at the beginning of the row, and then click on this button See I/O

Actions this assembly can perform:

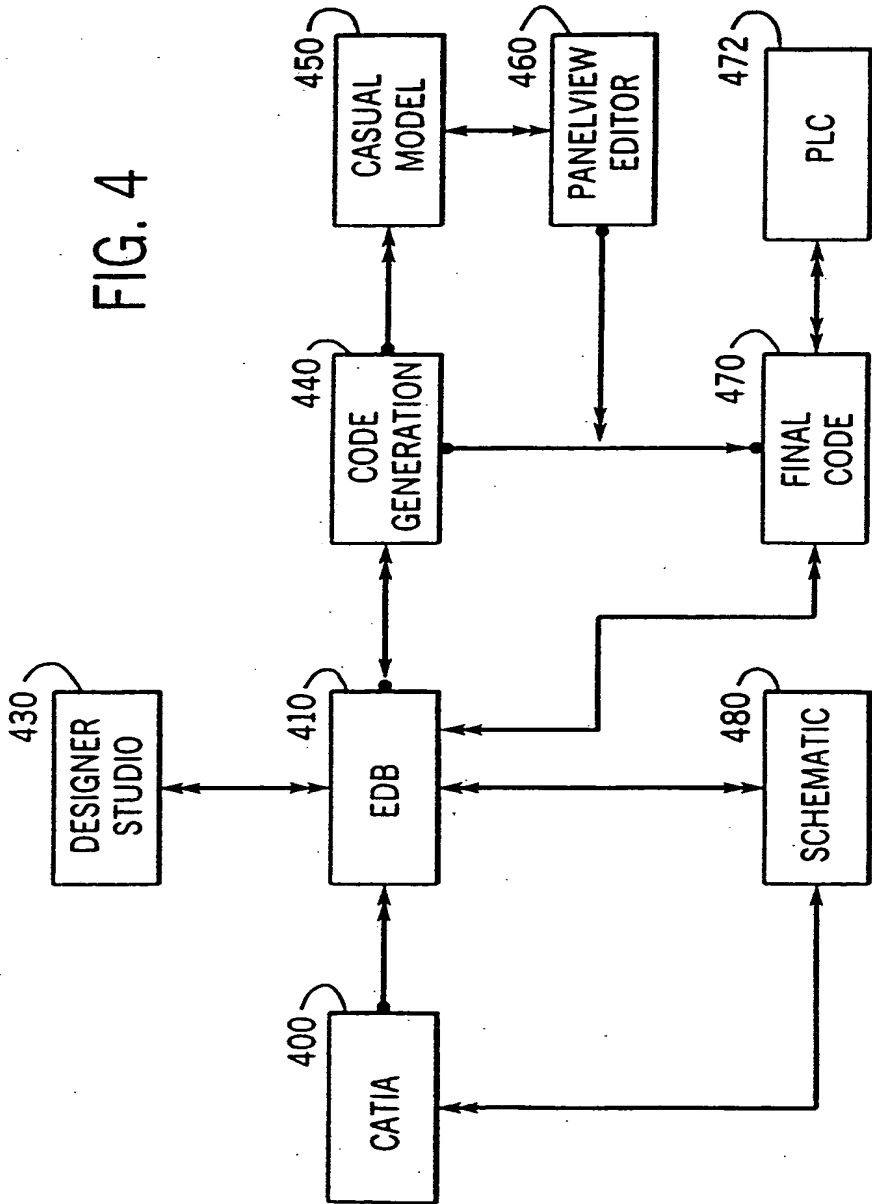
Open 1

Close 1 2

☐ Main Menu
☐ Structural Components subform
☐ WorkCell

FIG. 3

FIG. 4



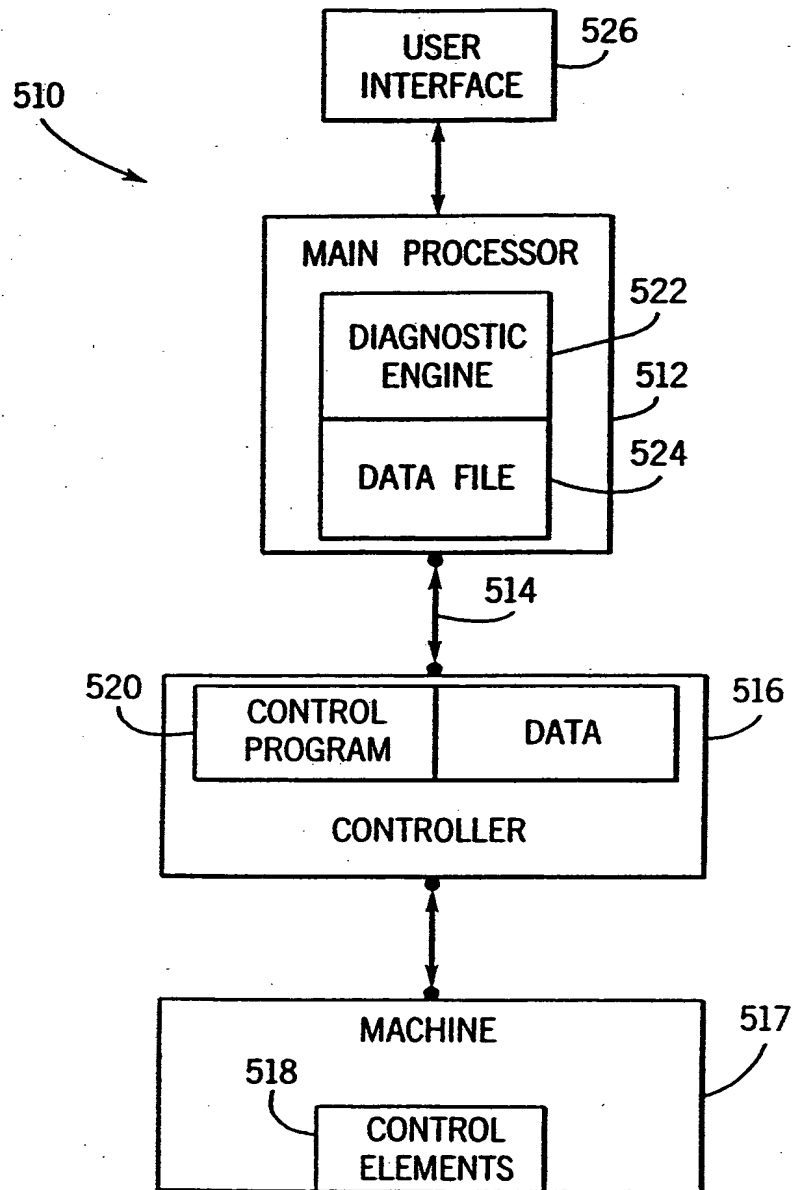


FIG. 5A

FIG. 5B

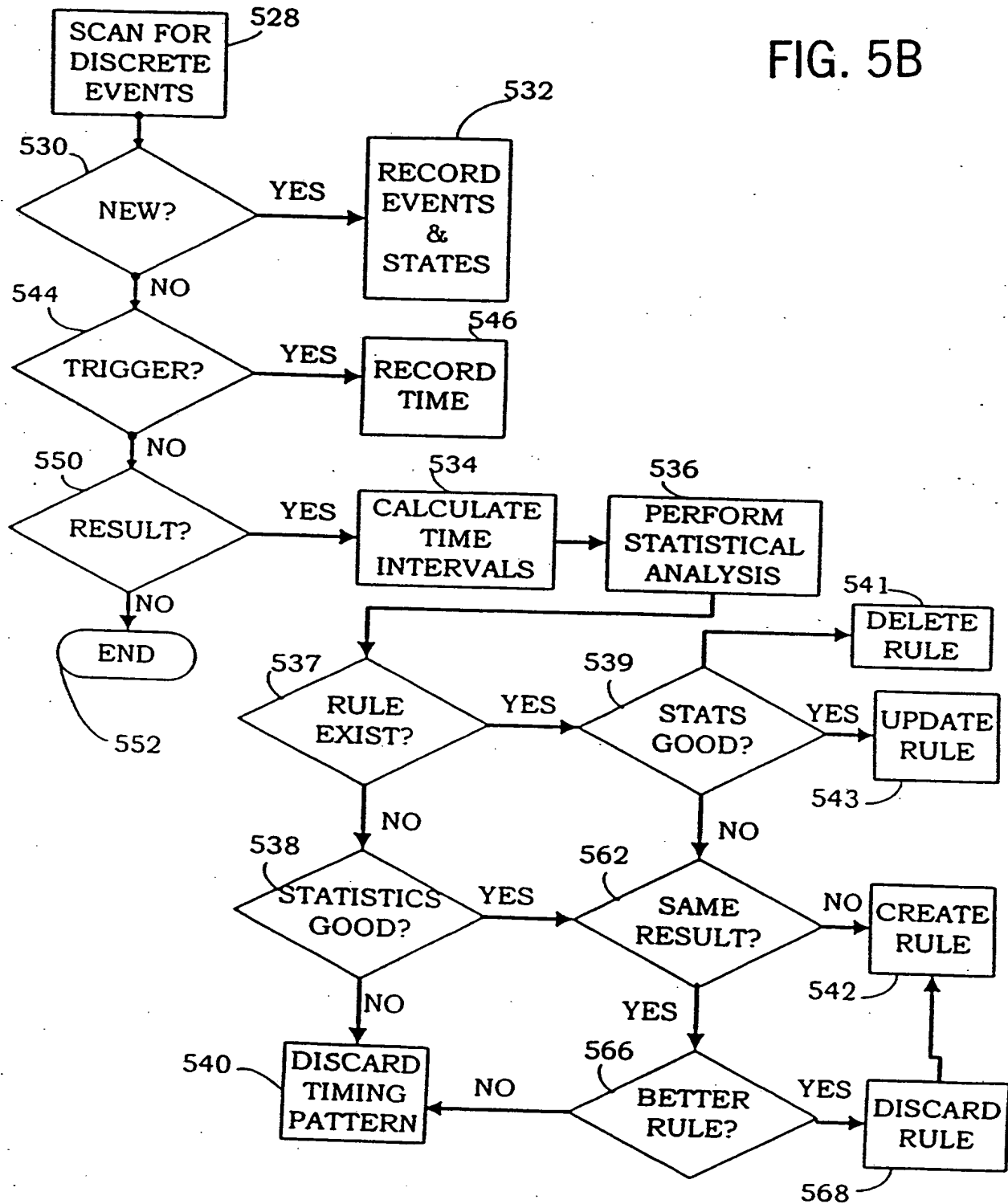
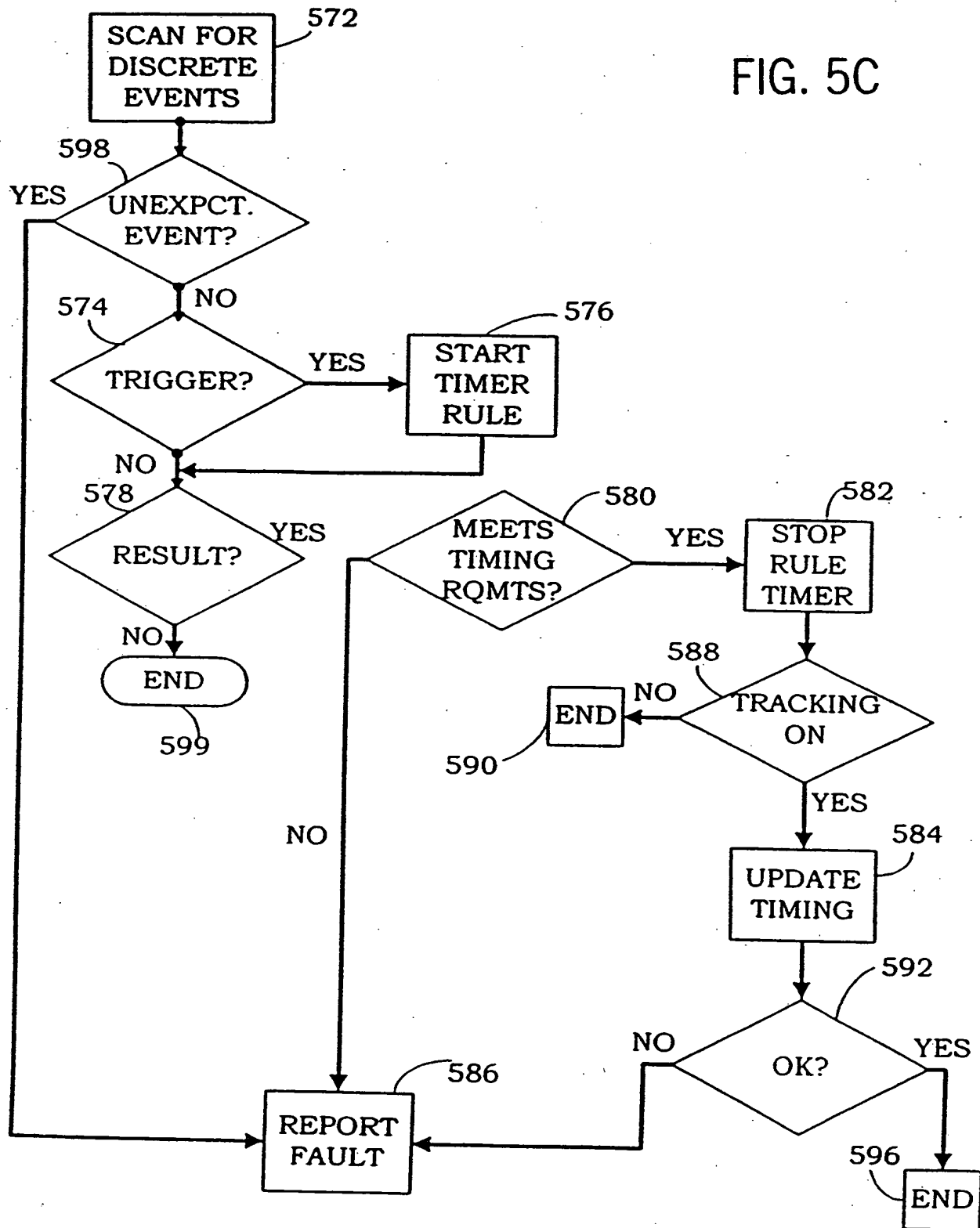


FIG. 5C



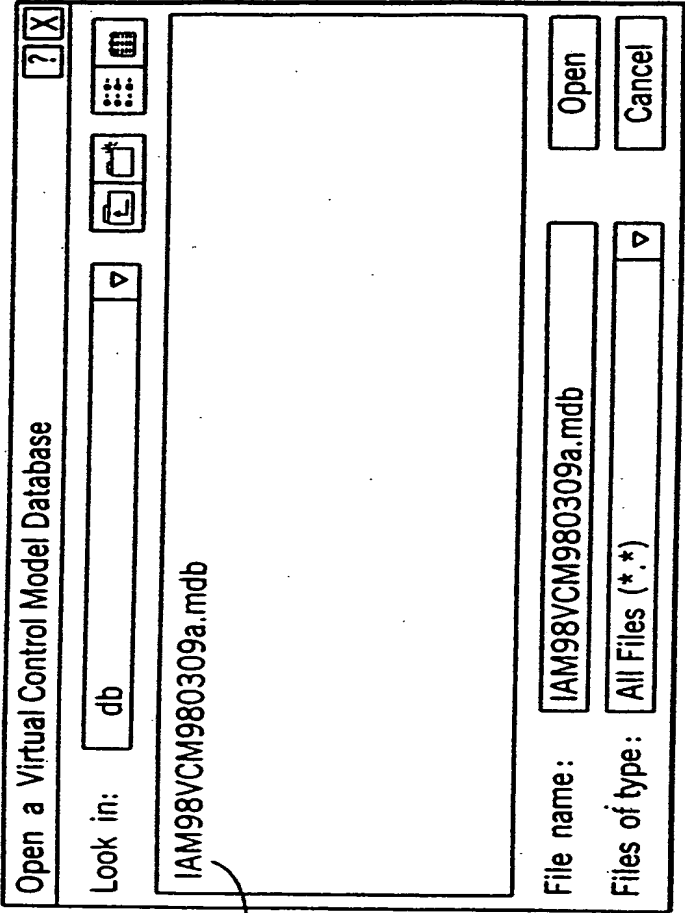
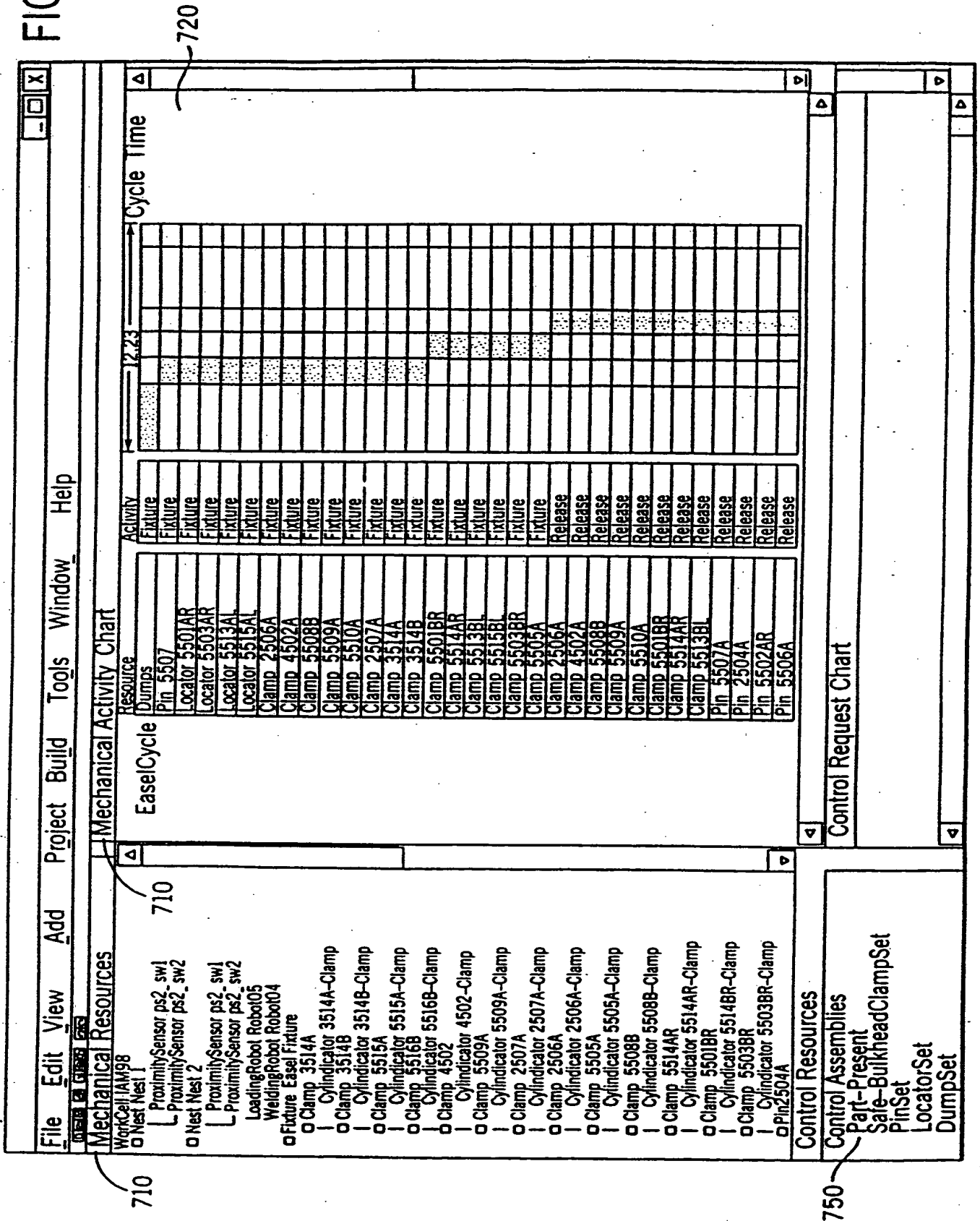
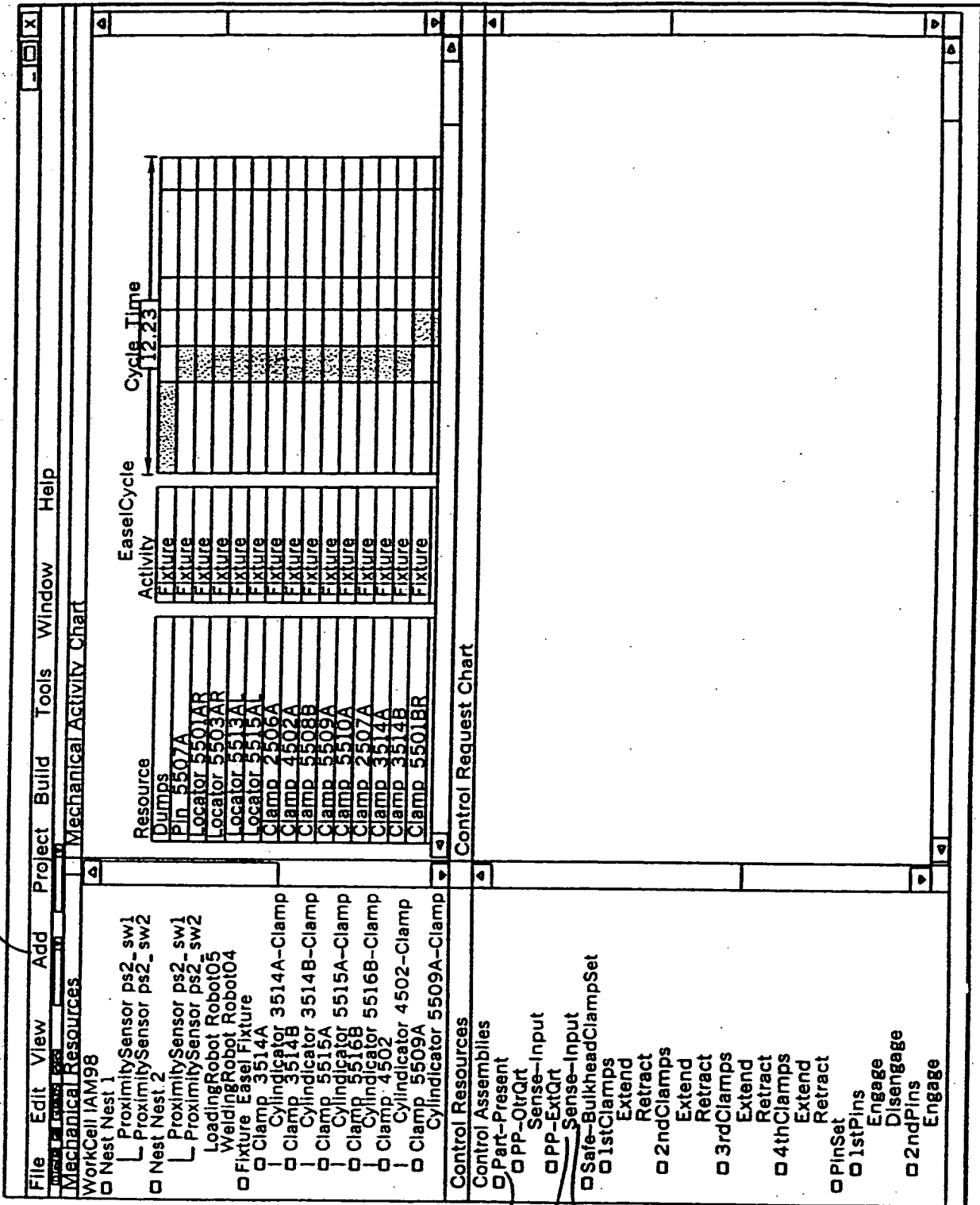


FIG. 6

FIG. 7





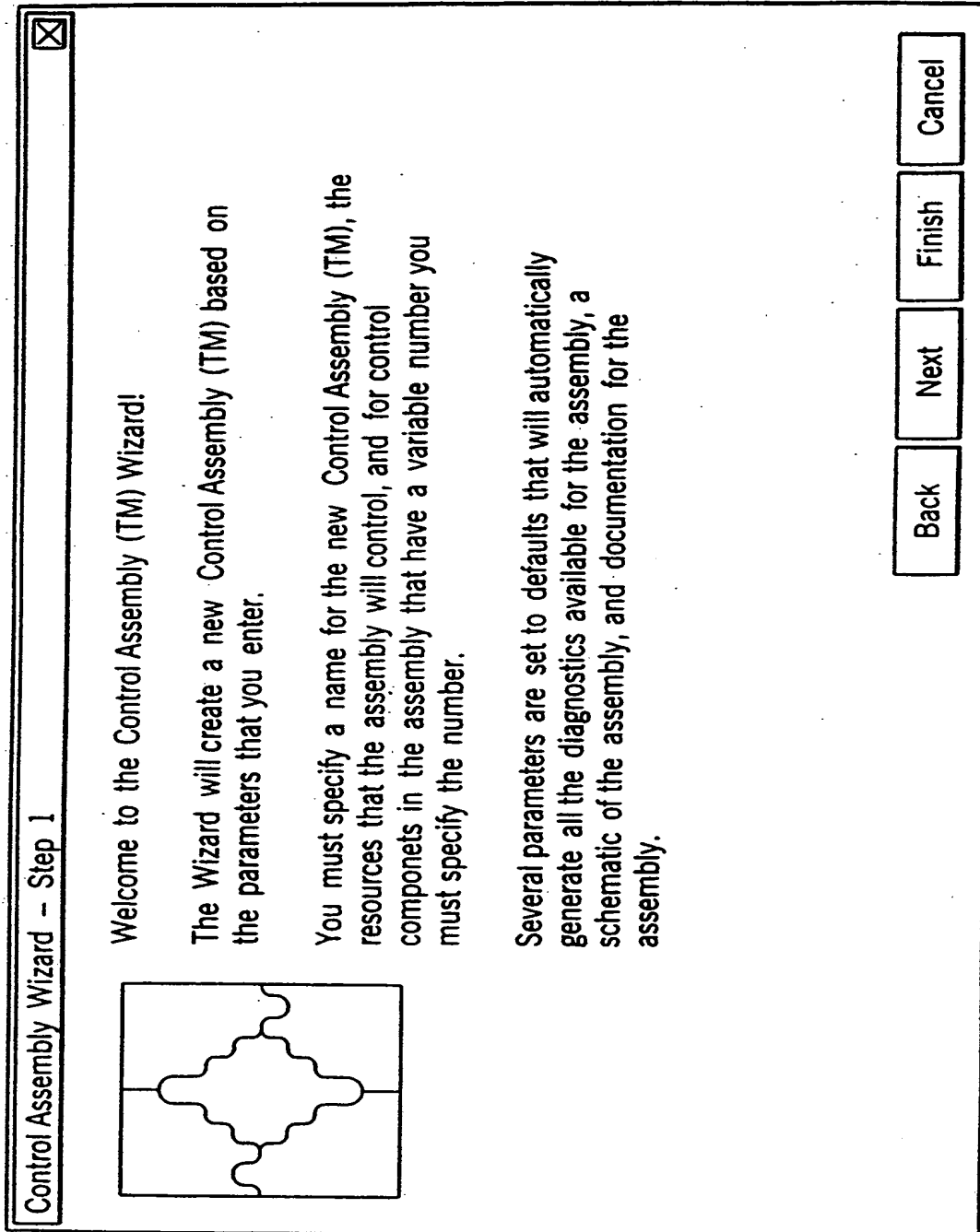
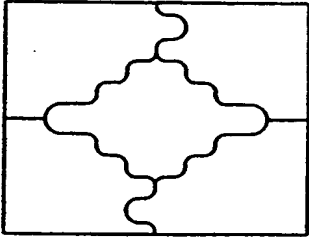


FIG. 9

Control Assembly Wizard -- Step 2 of 5



Control Assembly Type:
safe-bulkheadclampset

Specify name for the new Control Assembly 1000

Test

☒ Create Wiring Diagram for the assembly
☒ Create all available Diagnostics for the assembly
☒ Create Documentation for the assembly

Back

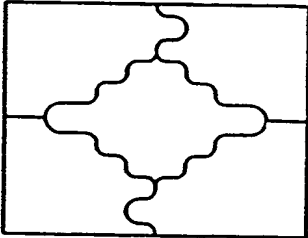
Next

Finish

Cancel

FIG. 10

Control Assembly Wizard - Step 3 of 5



Choose resources of type Clamp
that safe-bulkheadclampset wil control:

Available resources

Clamp 5505A

Clamp 3514A

Clamp 2506A

Clamp 5508B

Clamp 5514AR

Clamp 5501BR

Clamp 5503BR

Clamp 2507A

Add

Remove

Controlled resources

Clamp 3514B

Clamp 5515A

Clamp 5516B

Clamp 4502

Clamp 5509A

1100

1110

Back

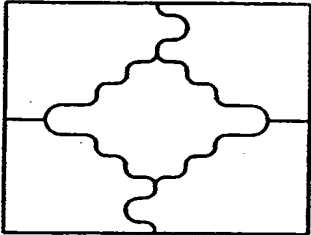
Next

Finish

Cancel

FIG. 11

Control Assembly Wizard - Step 4 of 5



Test

Control Assembly contains the following control components (suggested labels are supplied; you may replace them as needed):

Label	Control Component	Type	Function
	airvalve	doublesolenoid	main control
	airvalve	singlesolenoid	safety valve
Clamp 3514B	aircylinder	Cylindicator	air-motion coverter
Clamp 5515A	aircylinder	Cylindicator	air-motion coverter
Clamp 5516B	aircylinder	Cylindicator	air-motion coverter
Clamp 4502	aircylinder	Cylindicator	air-motion coverter
Clamp 5509A	aircylinder	Cylindicator	air-motion coverter

Back

Next

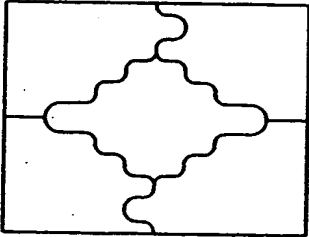
Finish

Cancel

FIG. 12

FIG. 13

Control Assembly Wizard - Step 5 of 5



New Control Assembly Summary

Control Assembly Wizard will create a new control a following specifications:

Control Assembly Type: Safe-BulkHeadClampSet

Control Assembly Info:
Name: Test
Author: Josiah Hoskins
Date: Mon Mar 16 13:54:53 CST 1998
Organization: Rockwell Automation
Tool: Rockwell Automation Enterprise Controls De

Project Info:
Name: IAM 98 Demo
Workspace: Database Name

Back

Next

Finish

Cancel

1300

FIG. 14

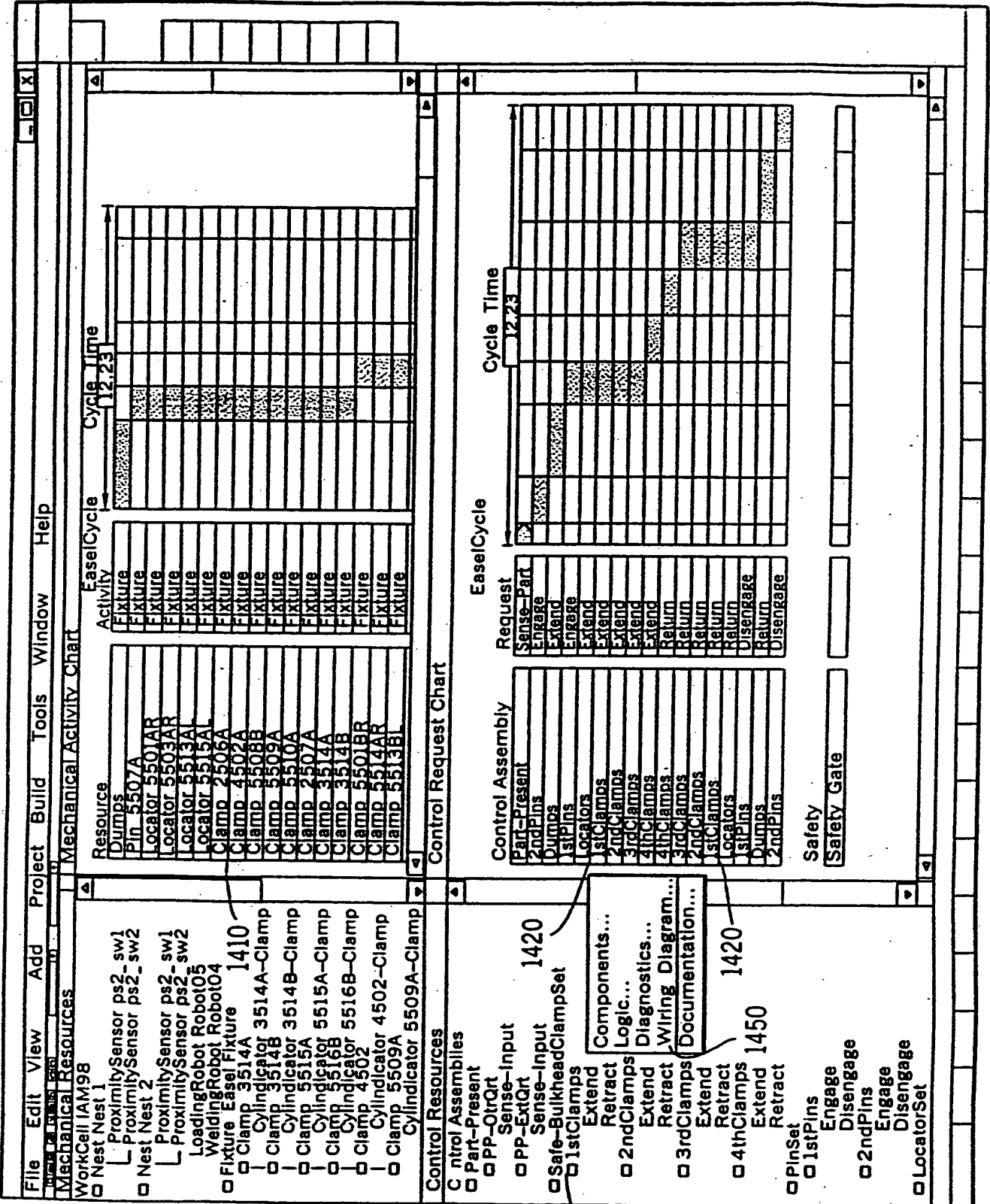


FIG. 15

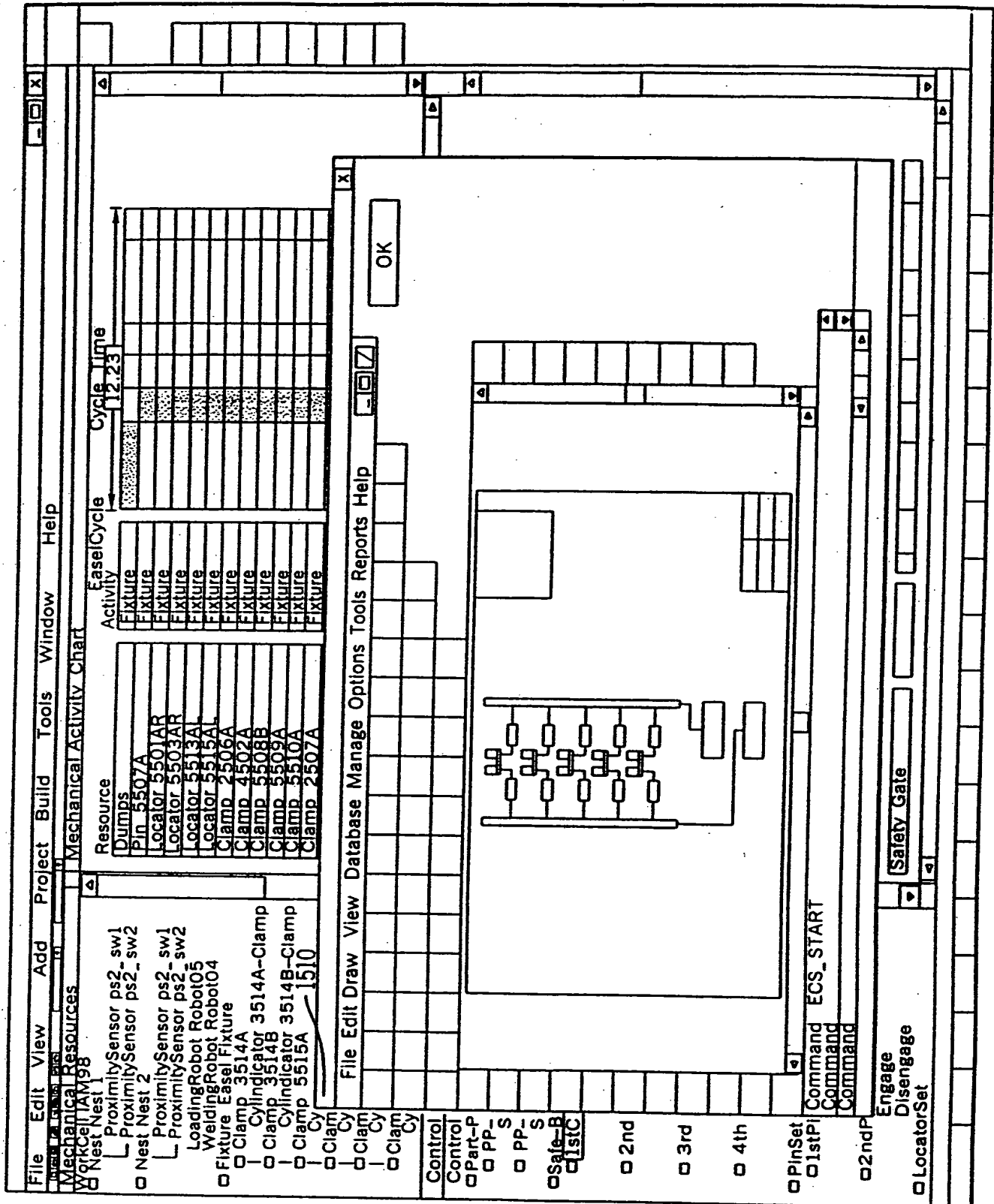


FIG. 16

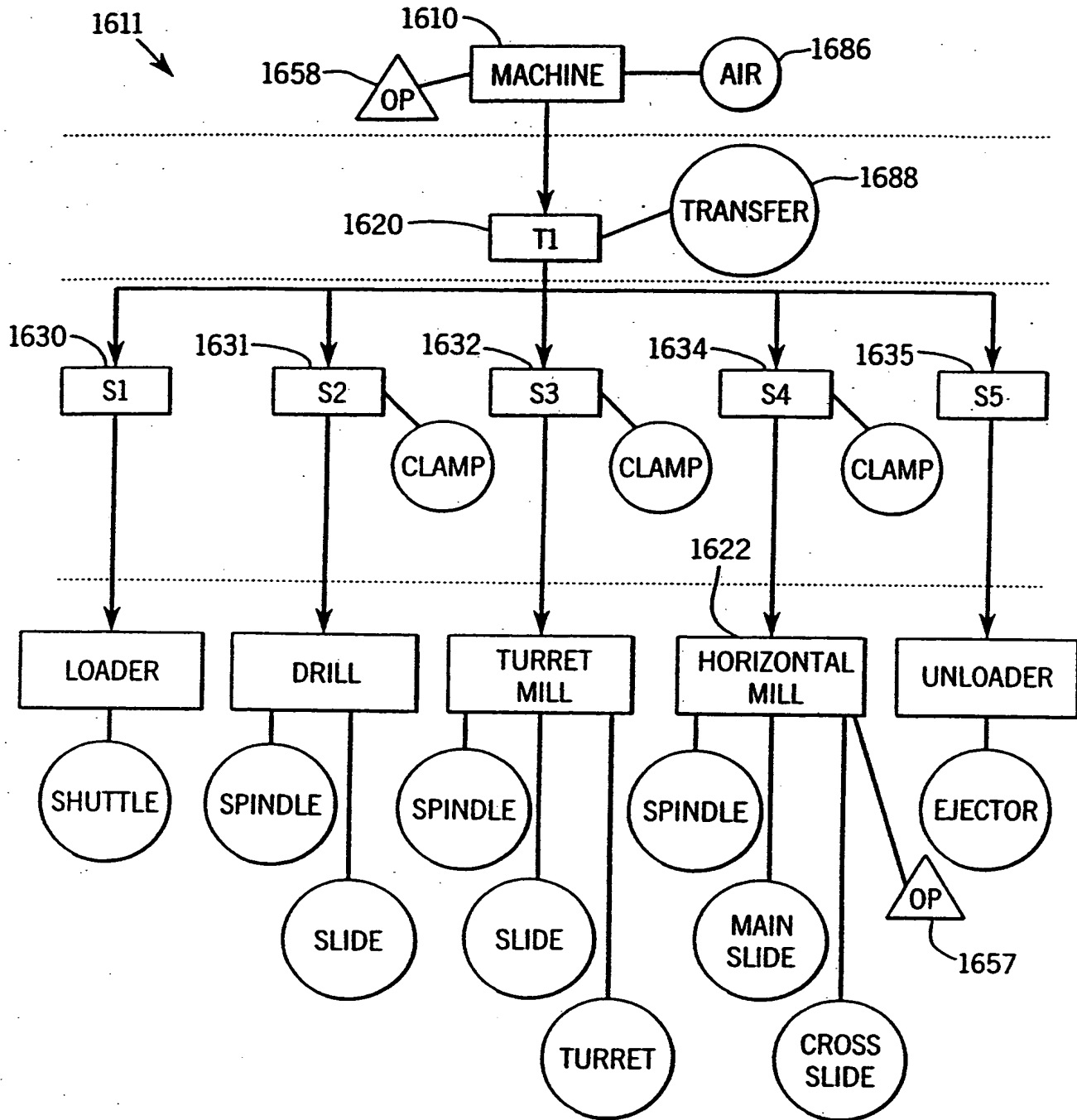


FIG. 17

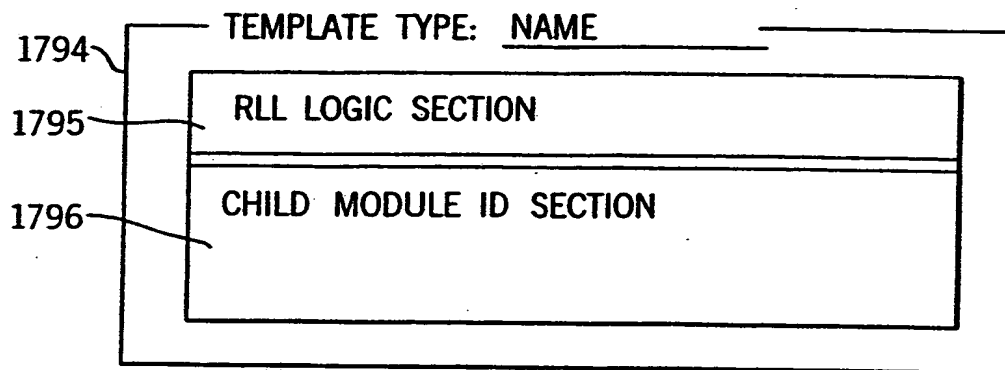


FIG. 23

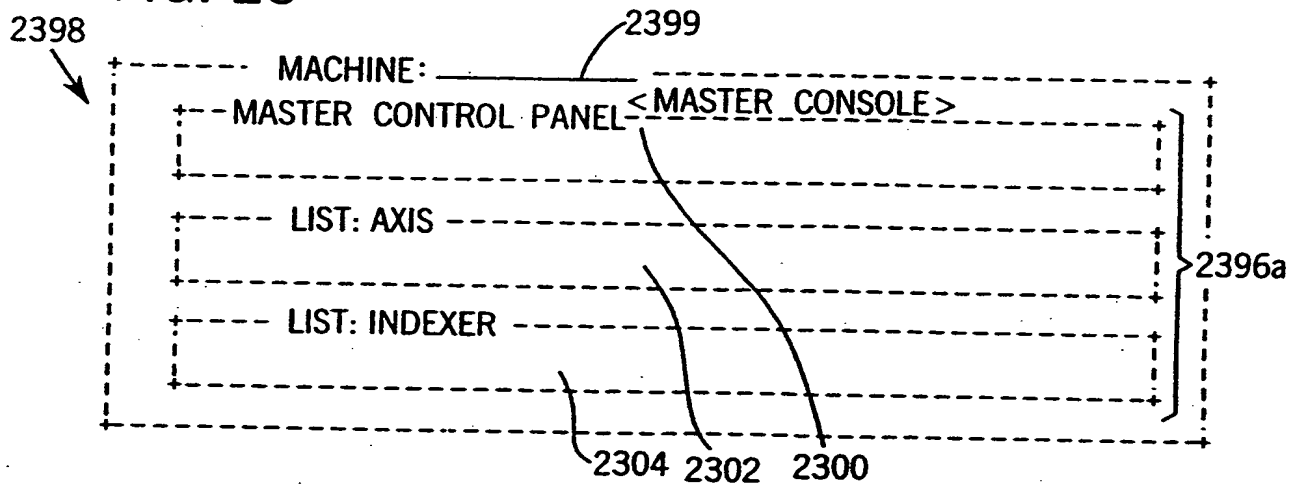


FIG. 18

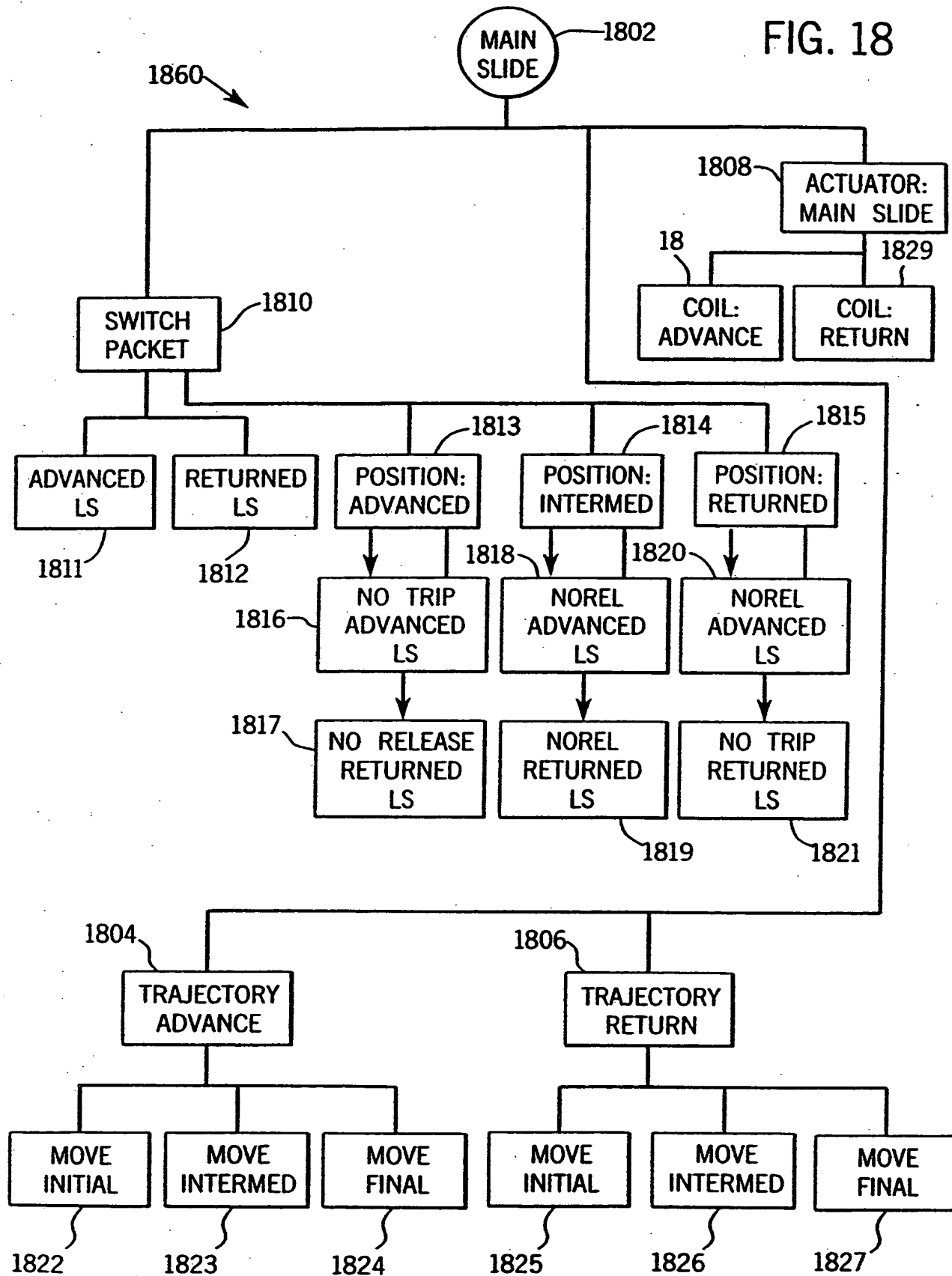


FIG. 19

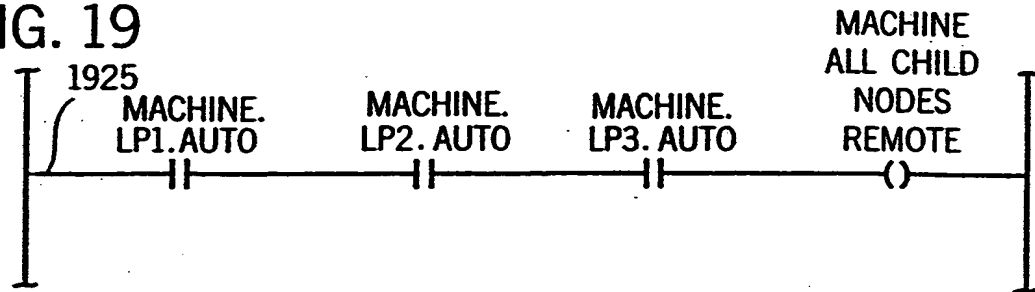


FIG. 20

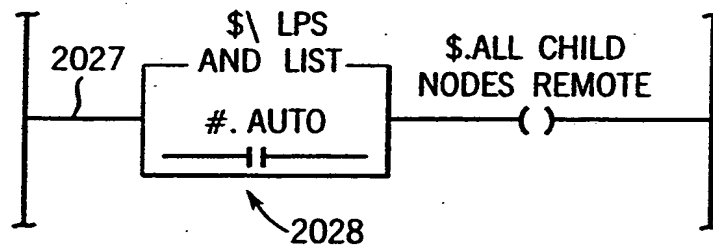


FIG. 21

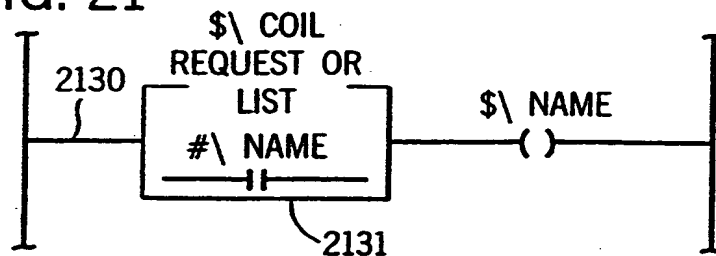


FIG. 22

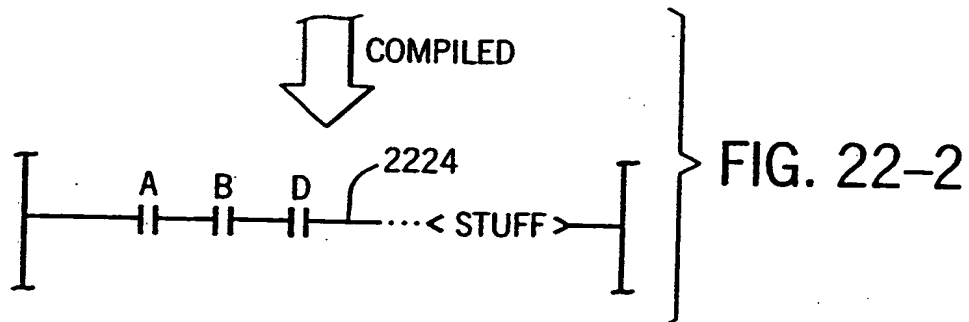
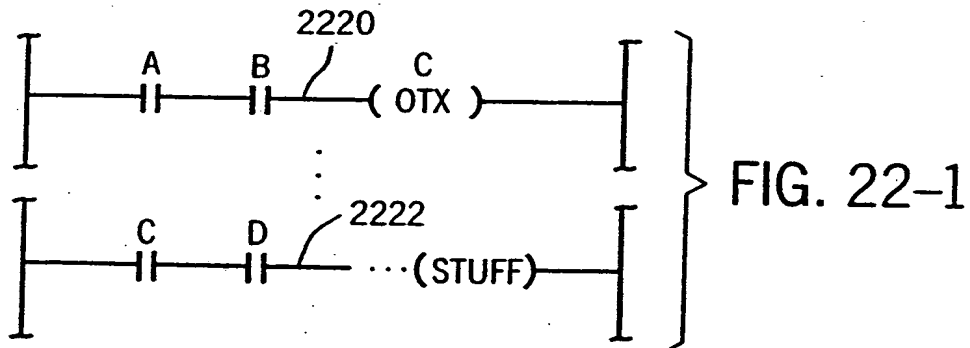
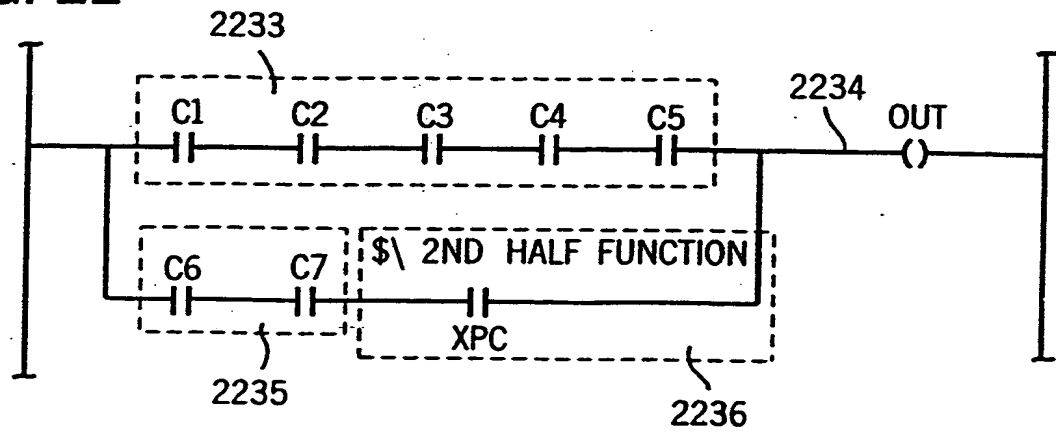


FIG. 24

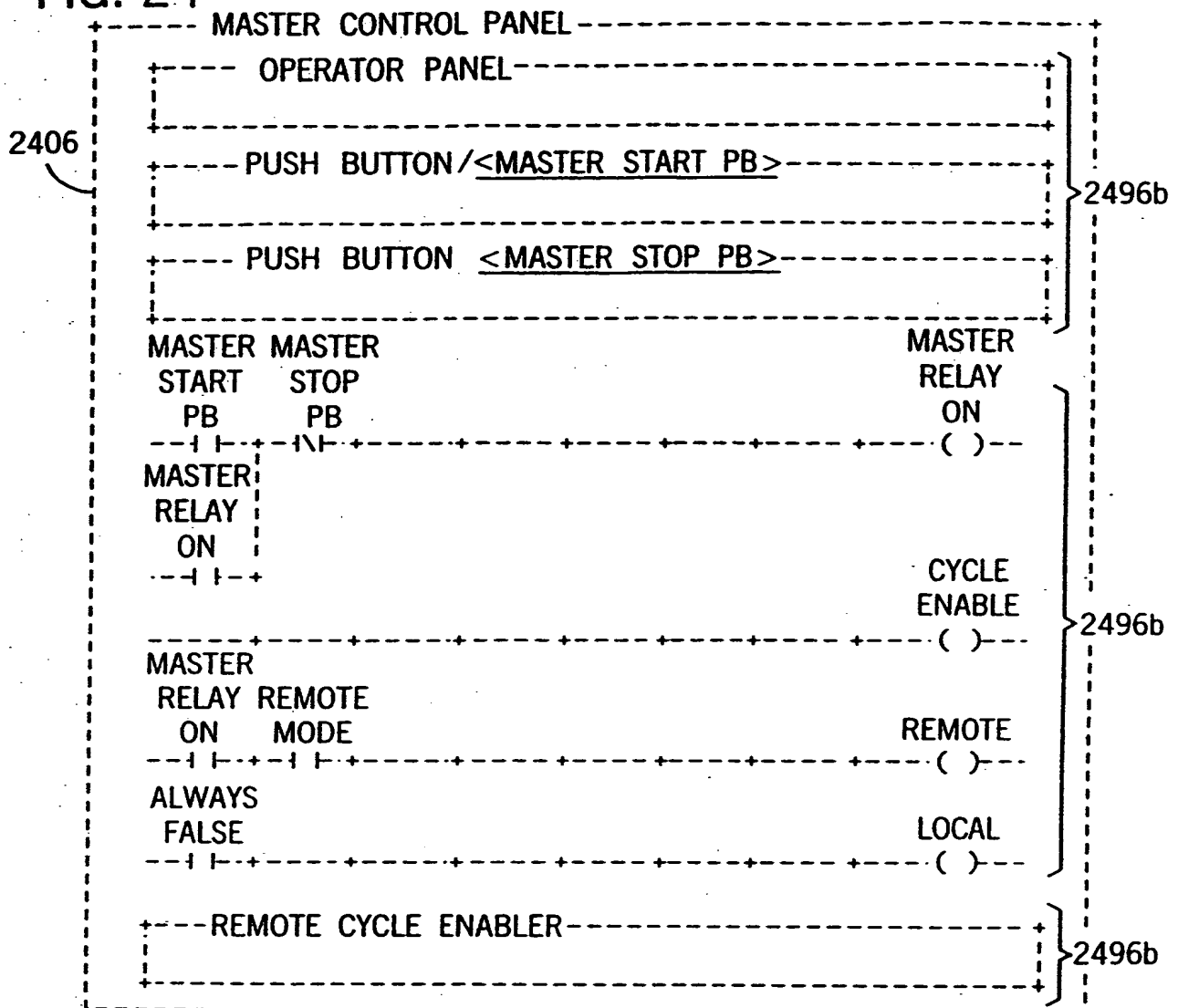


FIG. 25

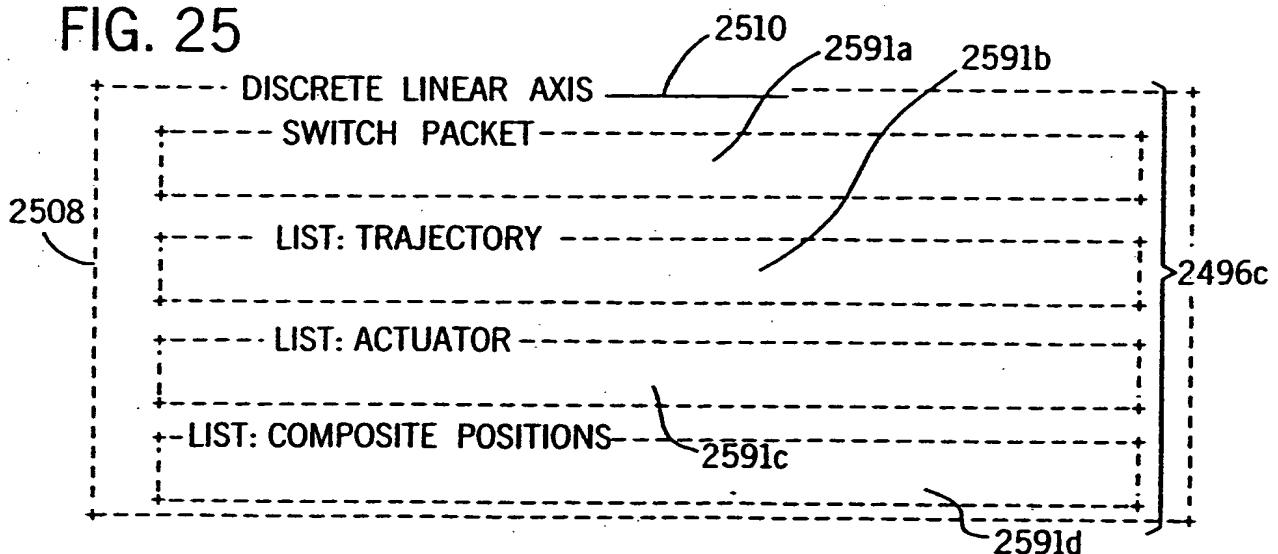


FIG. 26

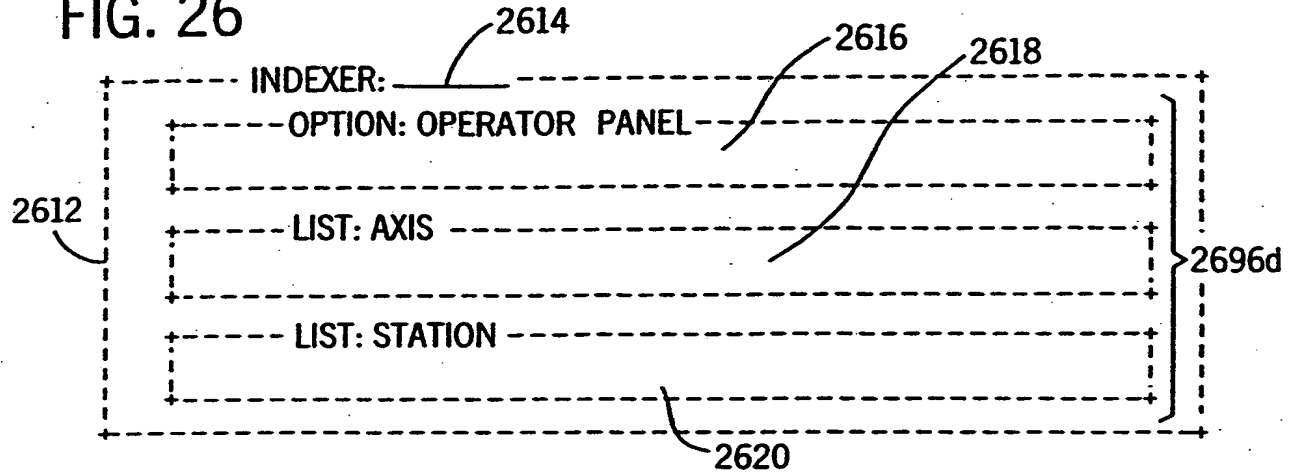


FIG. 27

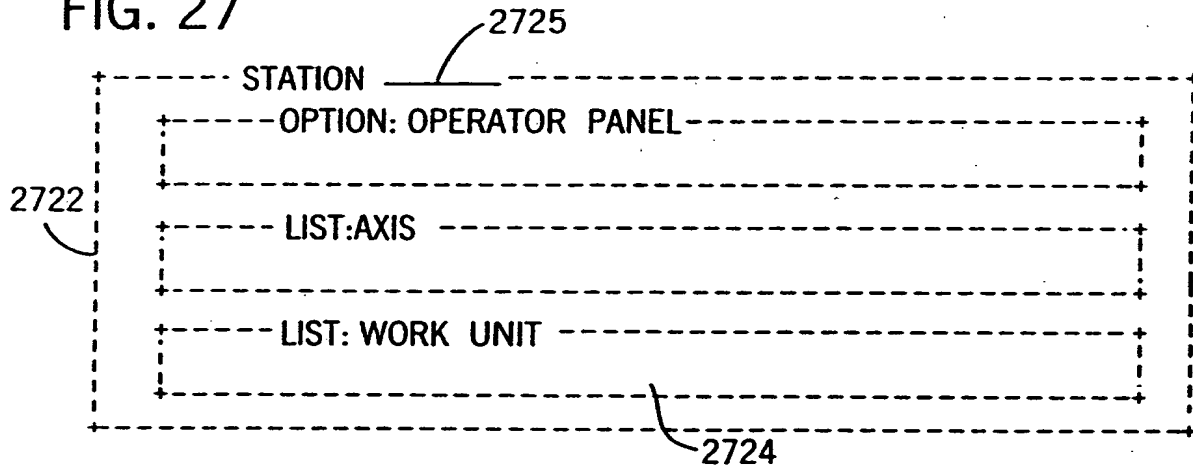
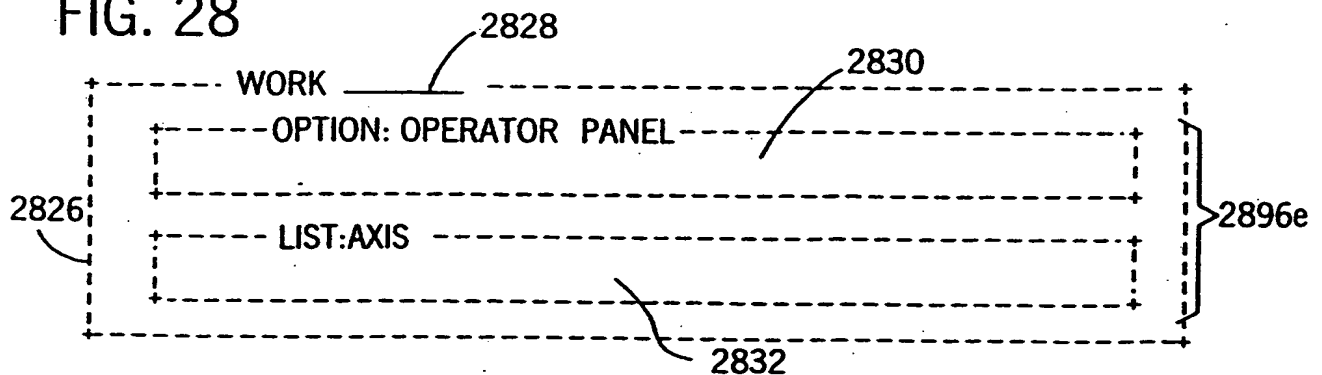


FIG. 28



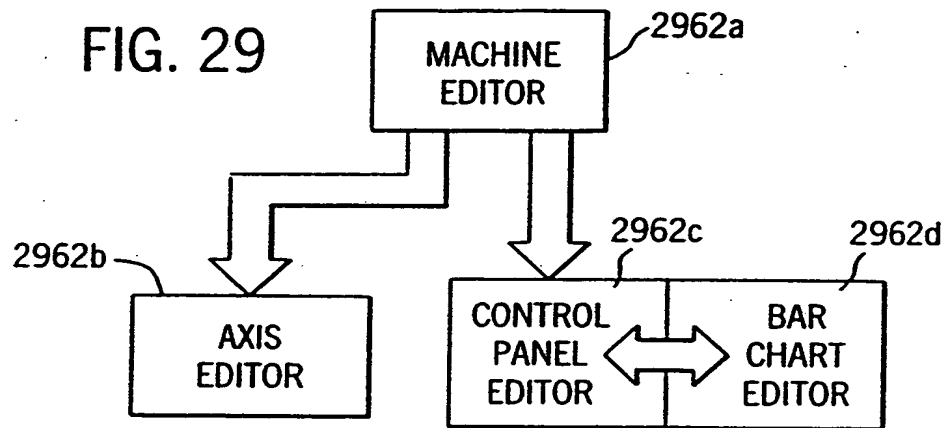


FIG. 30

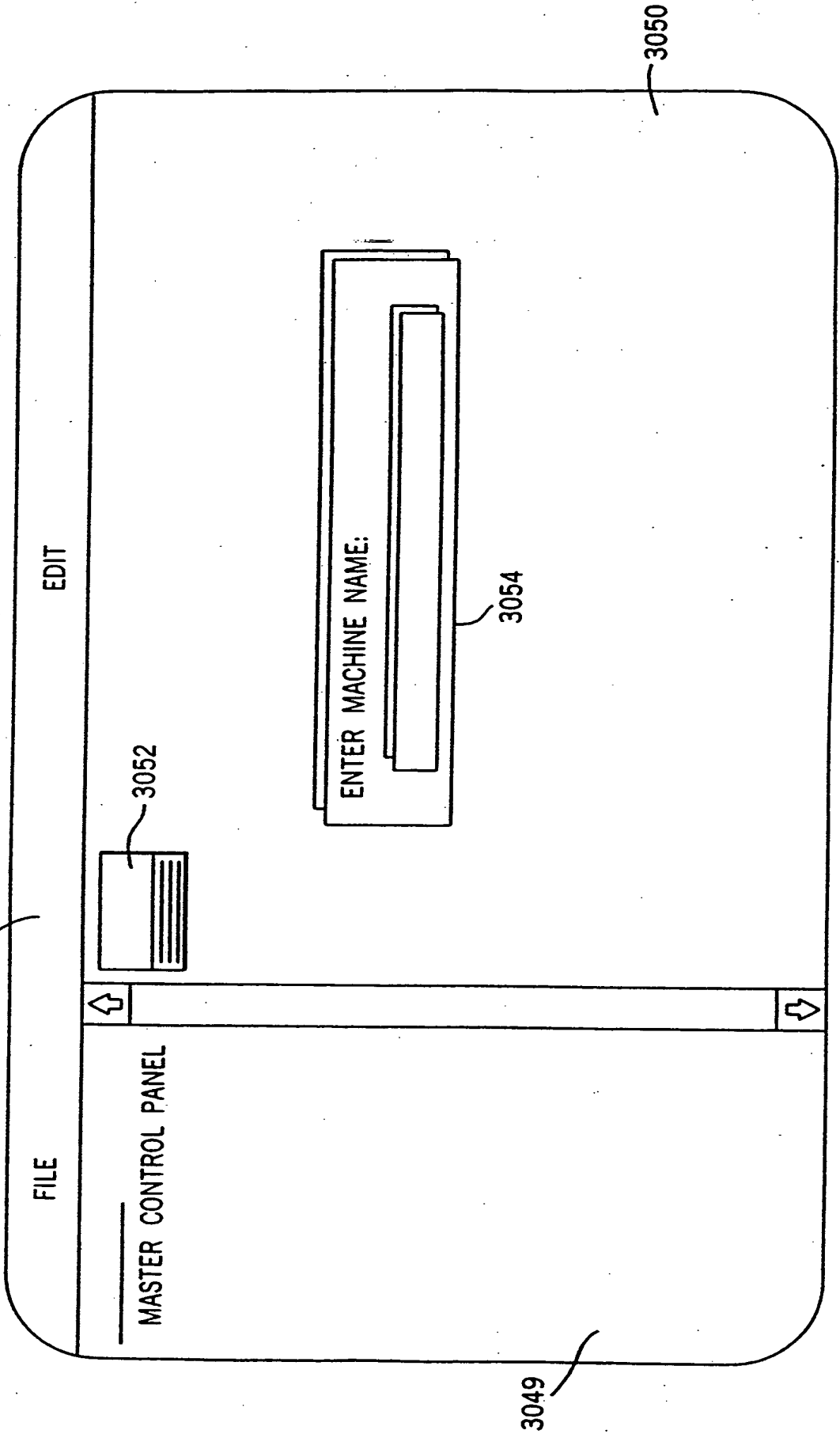
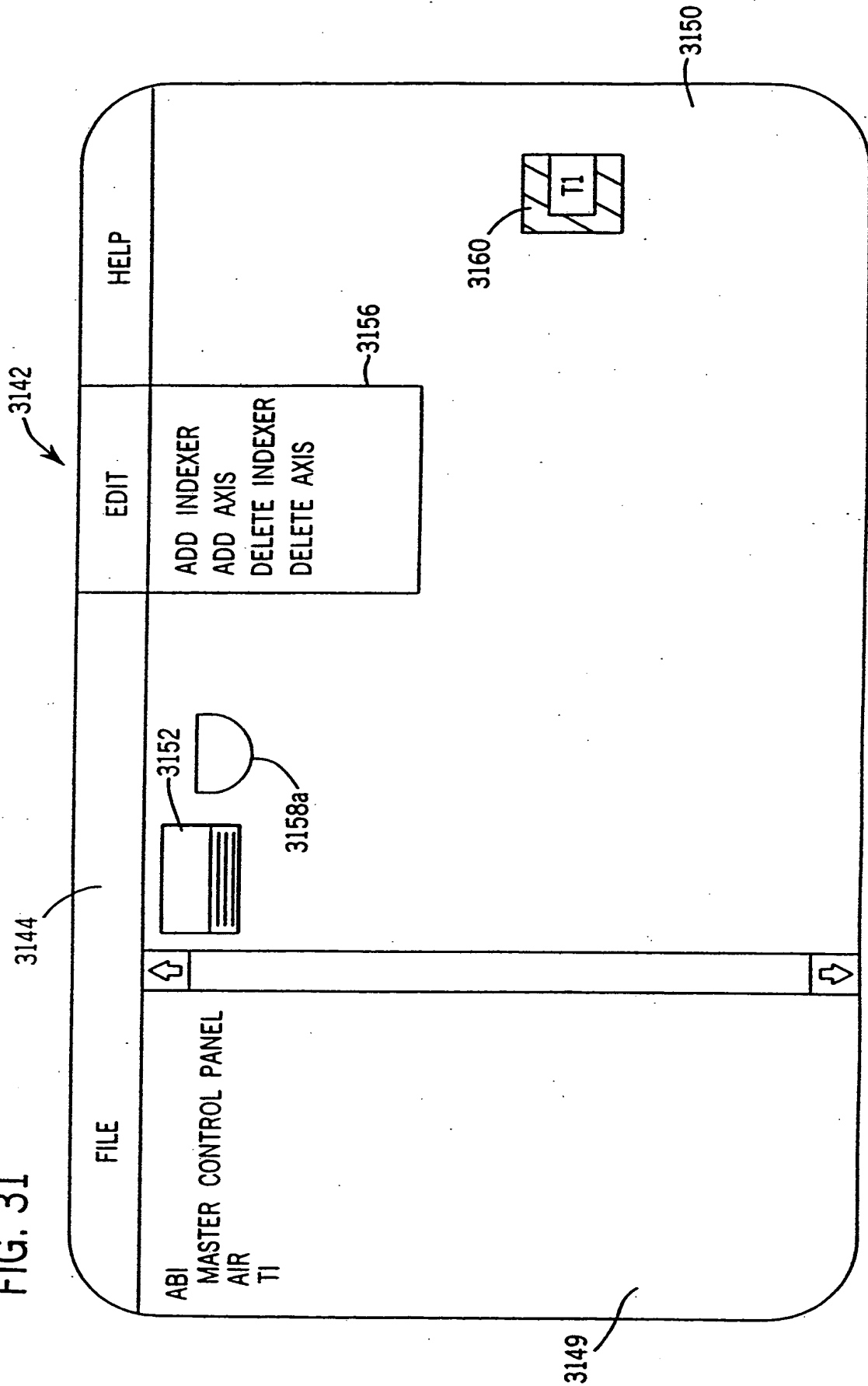


FIG. 31



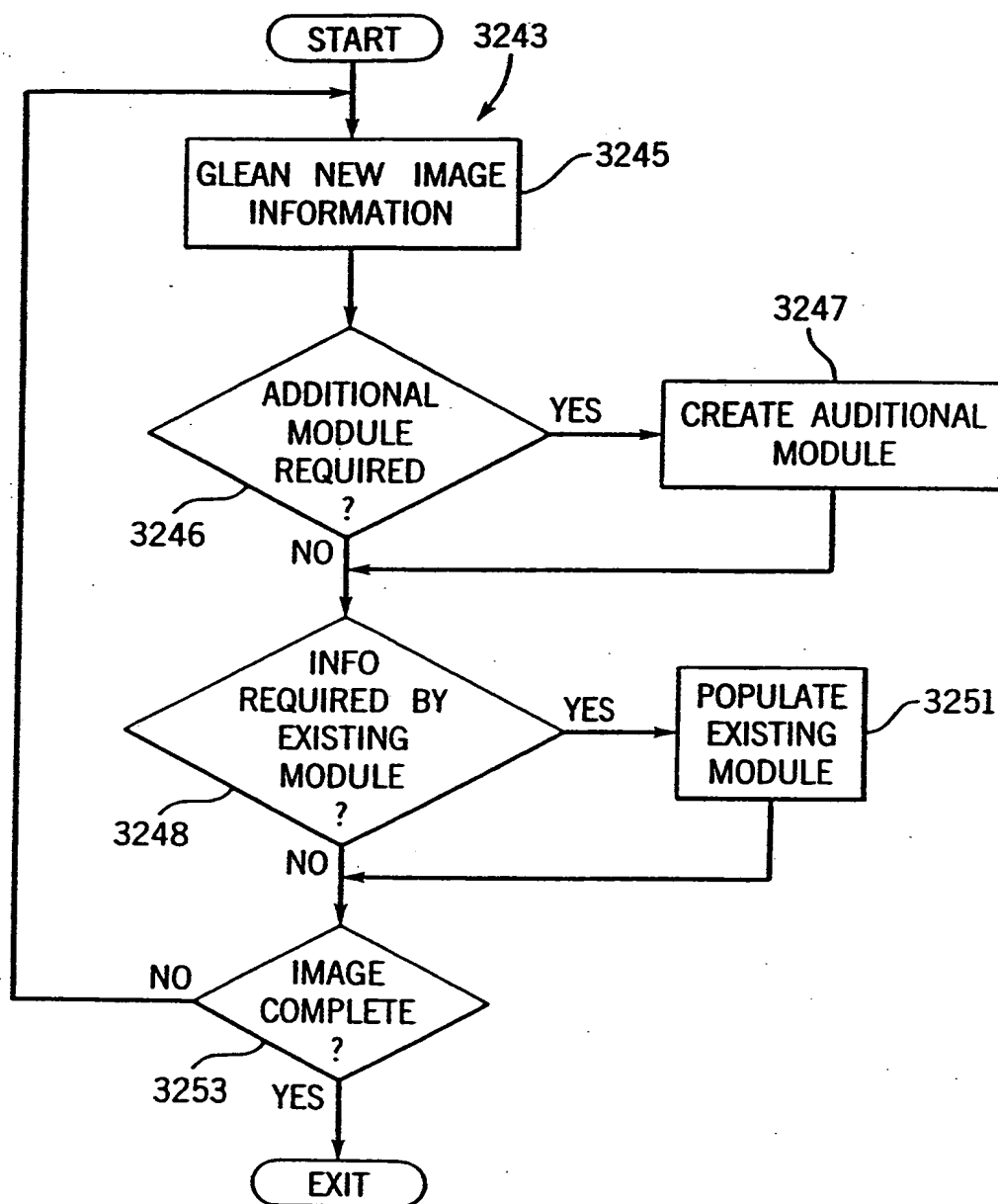
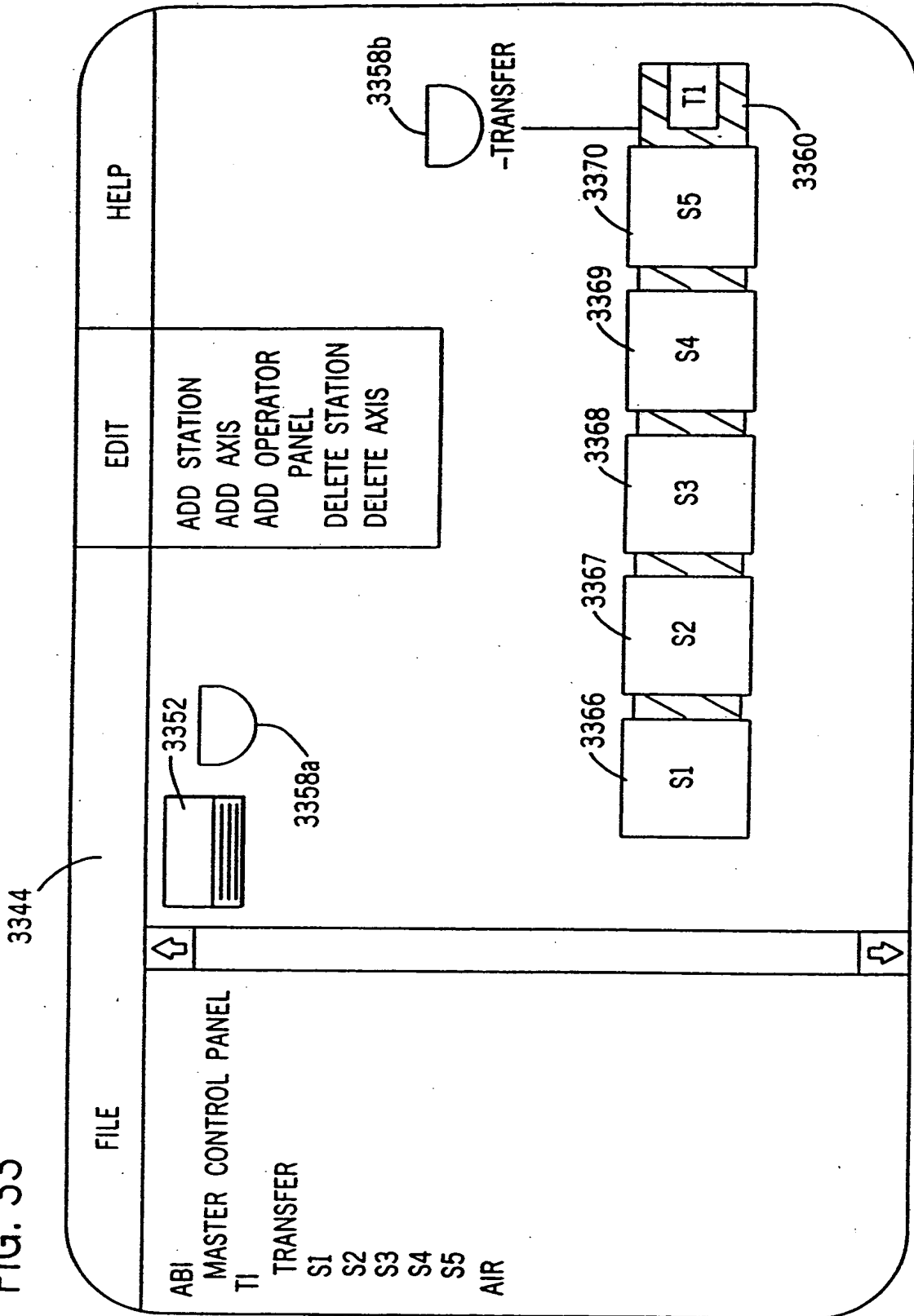


FIG. 32

FIG. 33



3444-

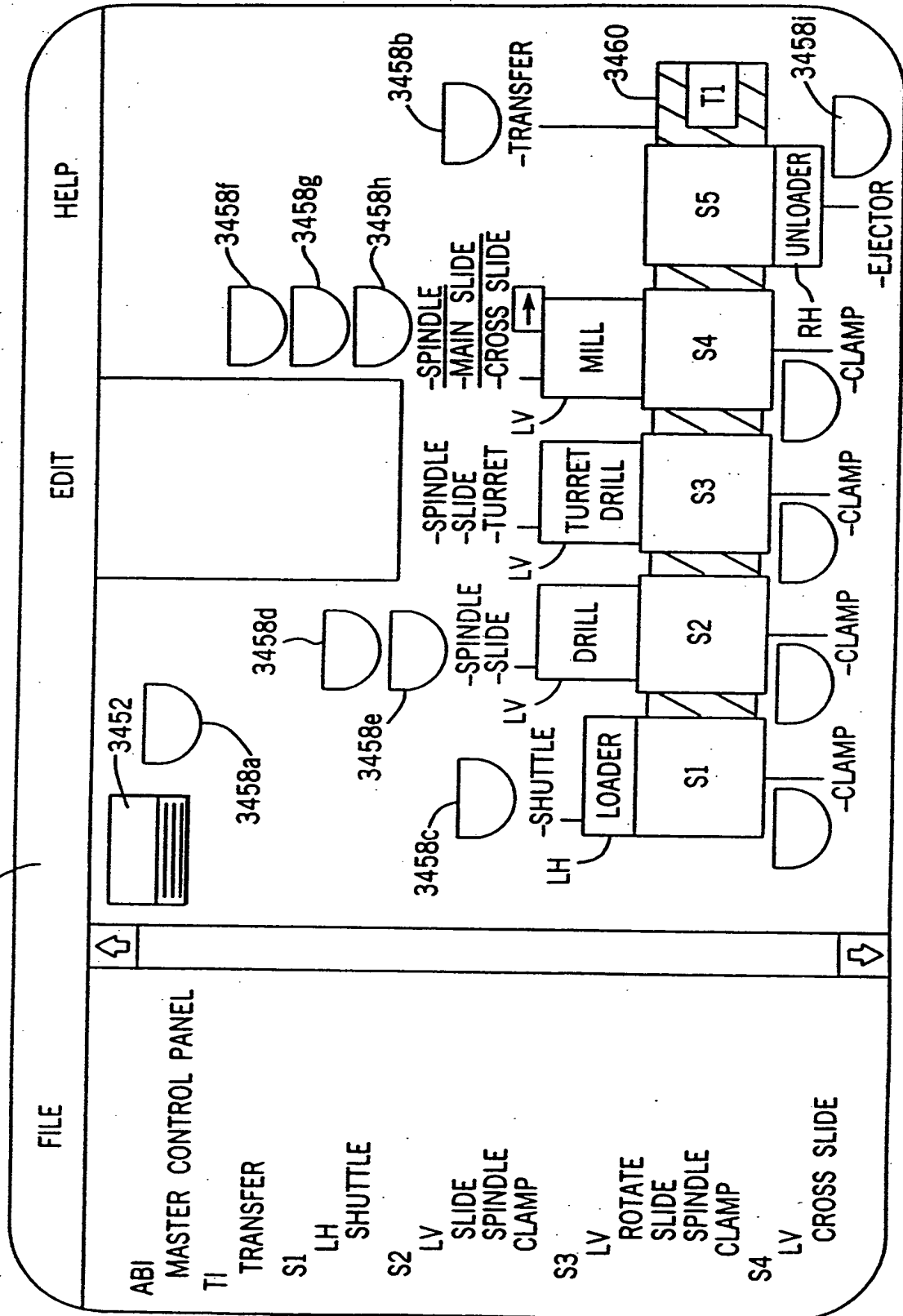
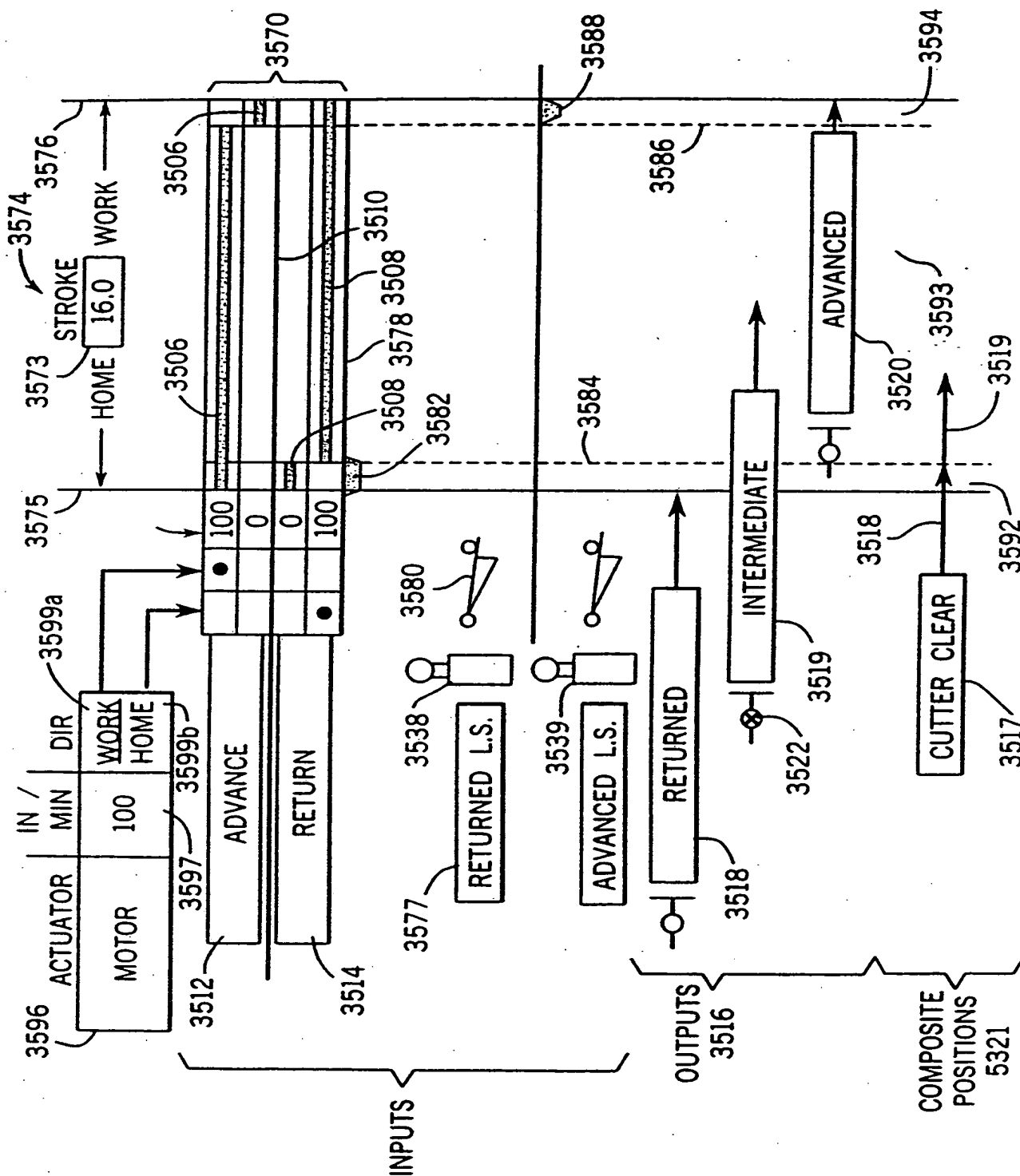


FIG. 35



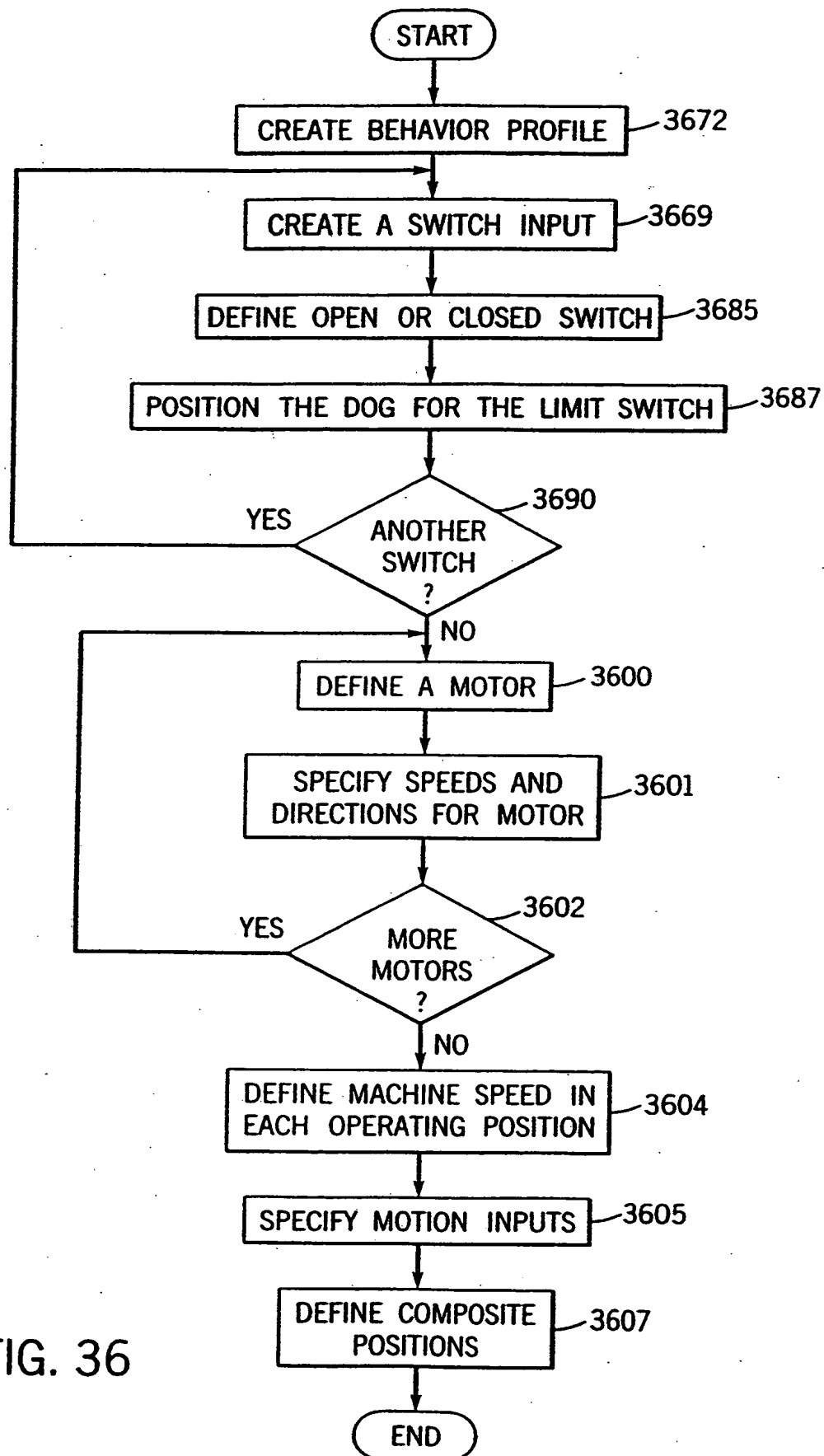


FIG. 36

FIG. 37

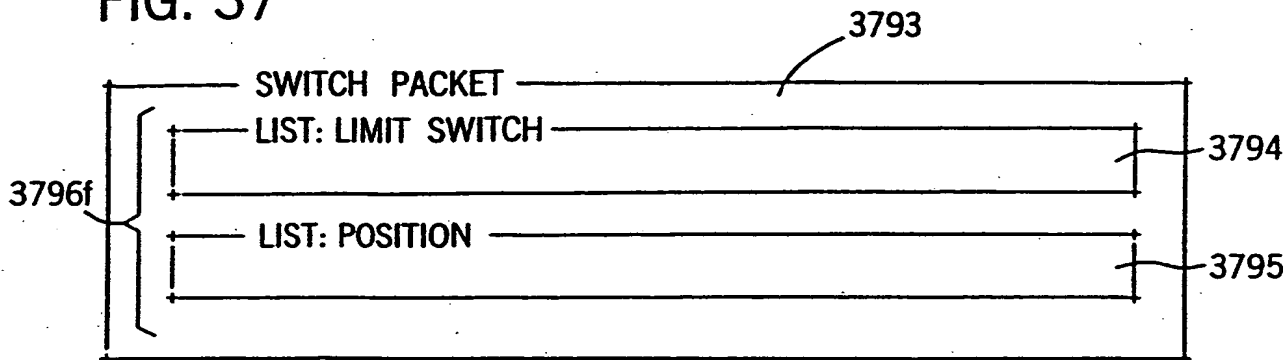


FIG. 38

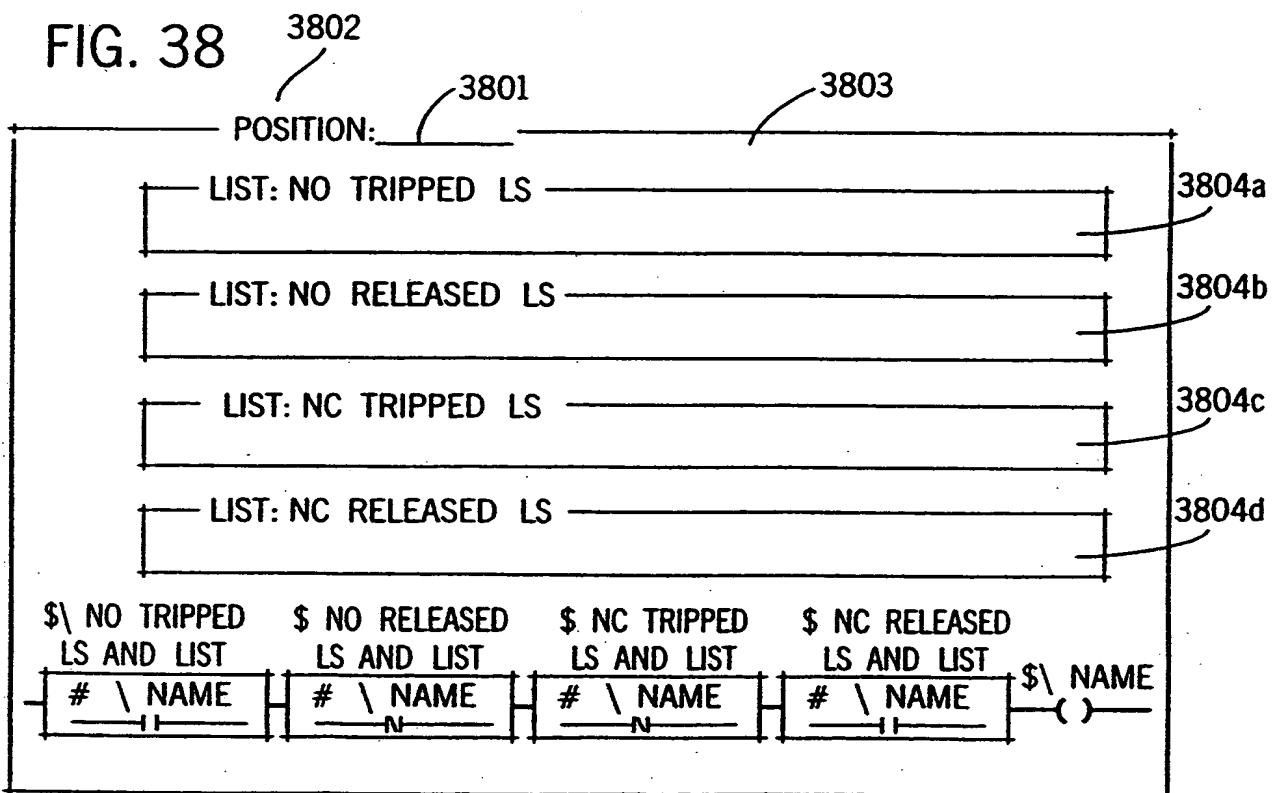


FIG. 39

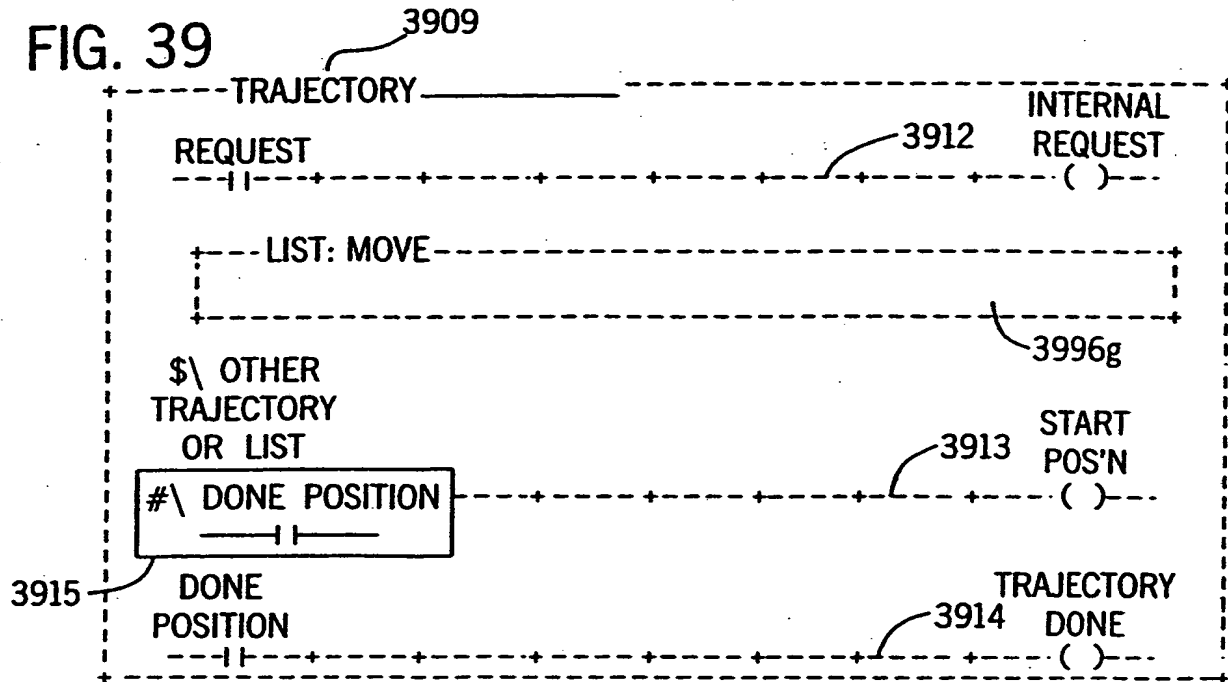


FIG. 40

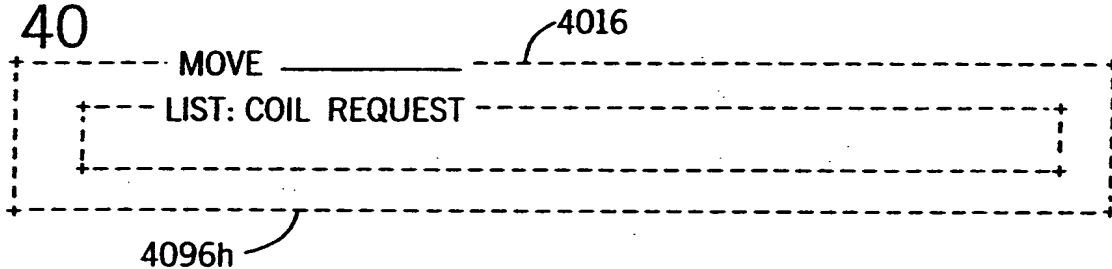


FIG. 41

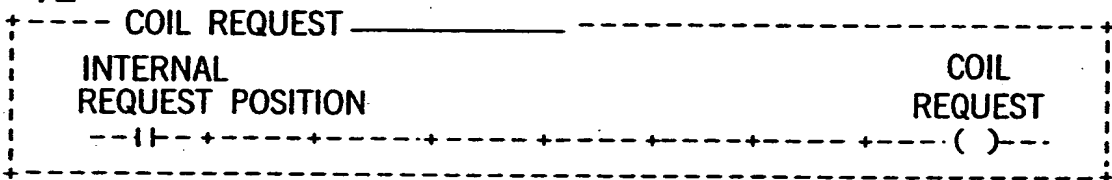


FIG. 42

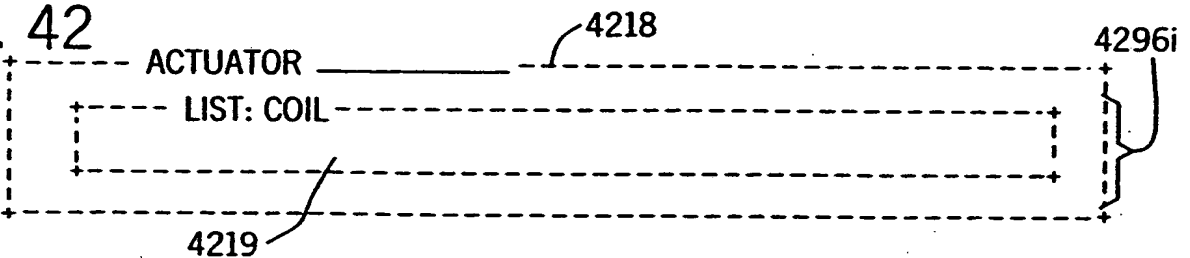


FIG. 43

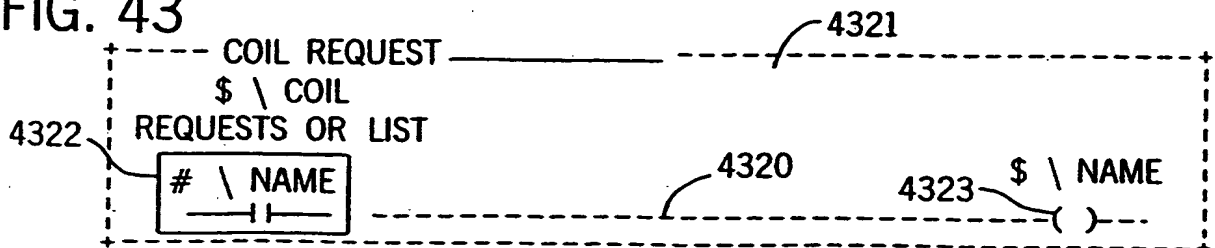


FIG. 44

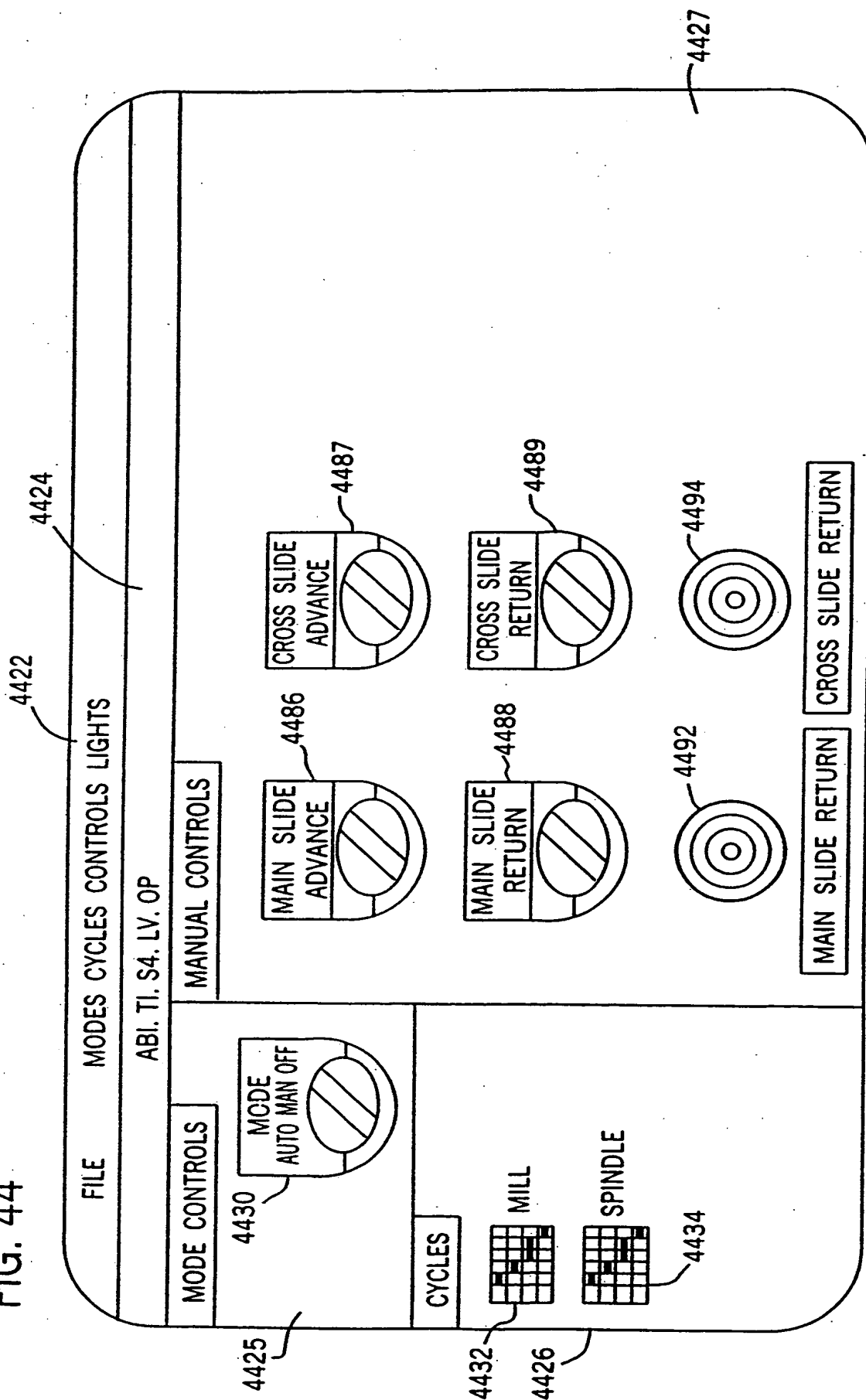


FIG. 45

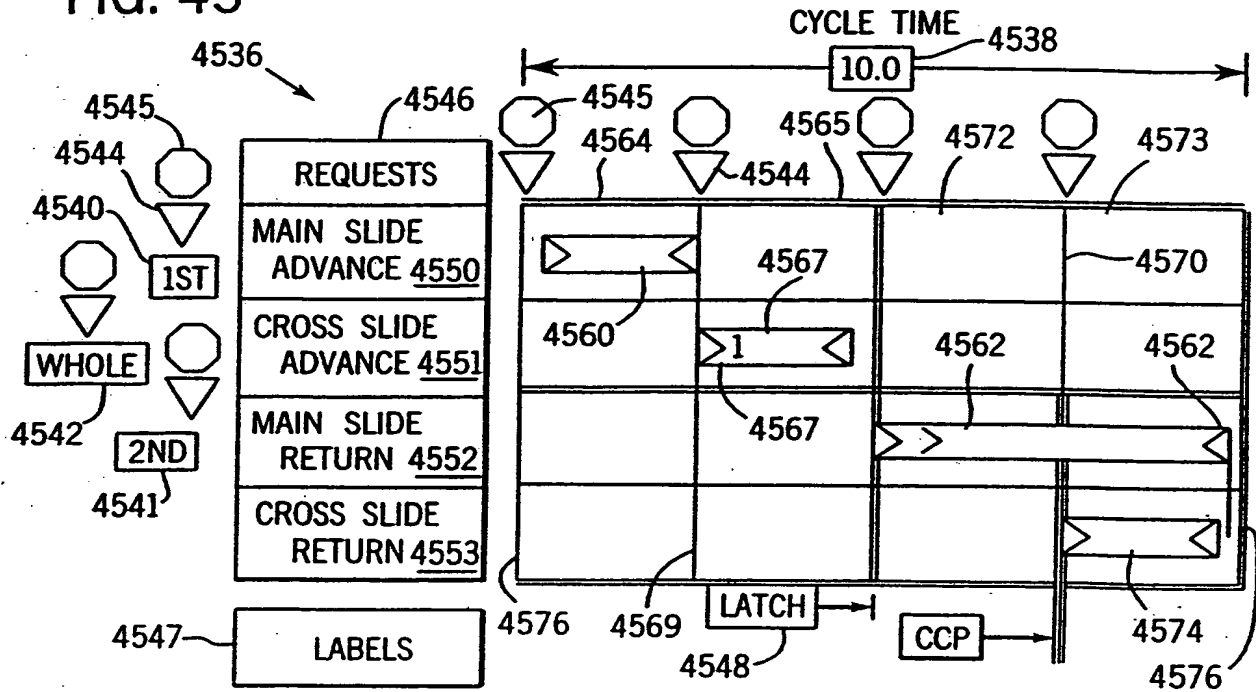


FIG. 46

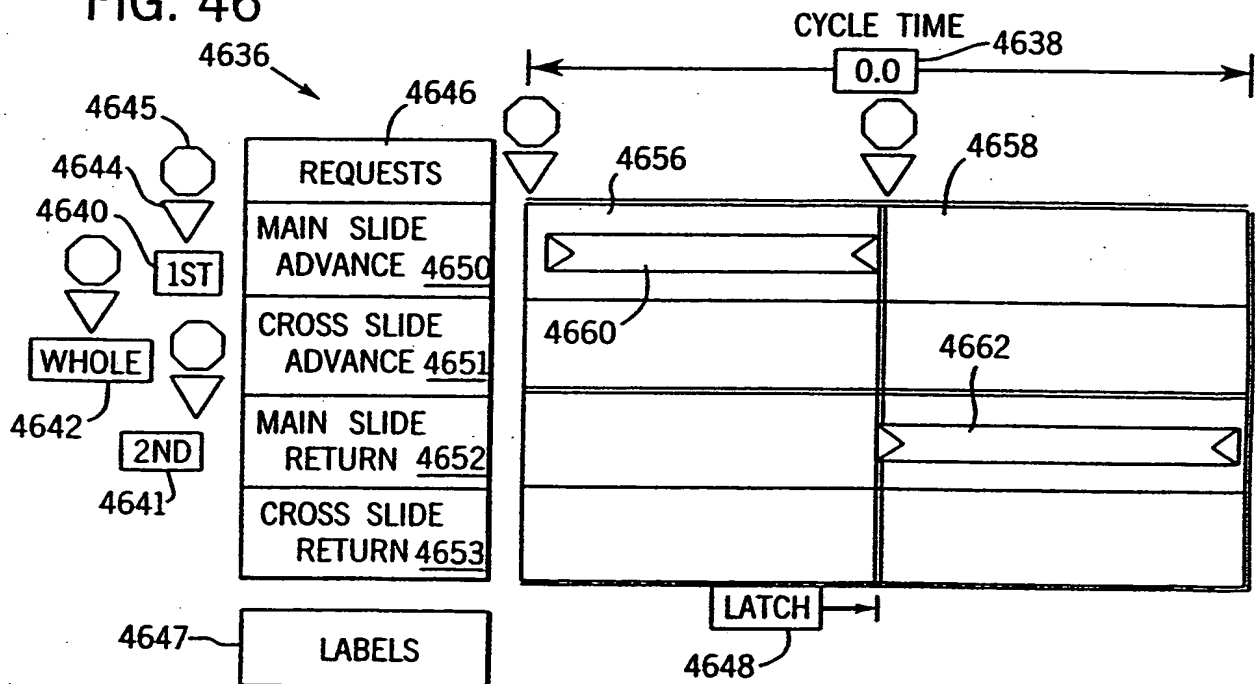
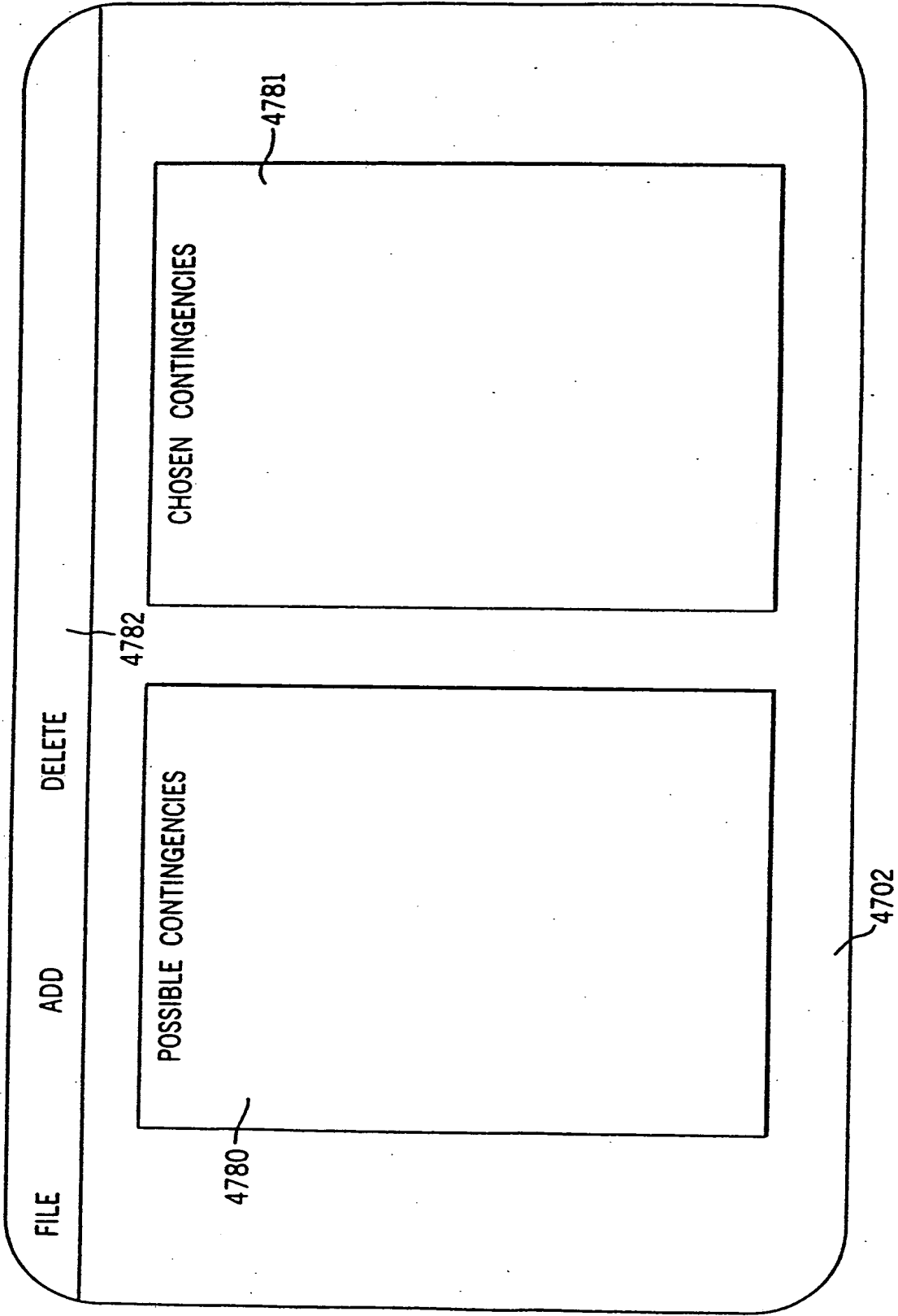


FIG. 47



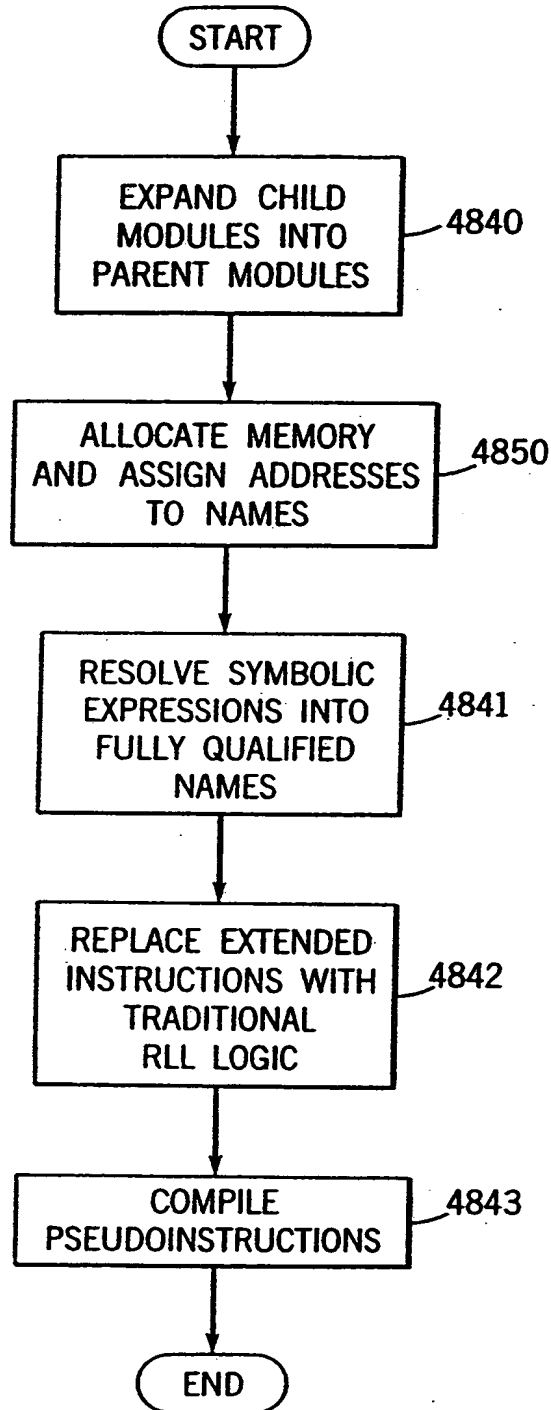
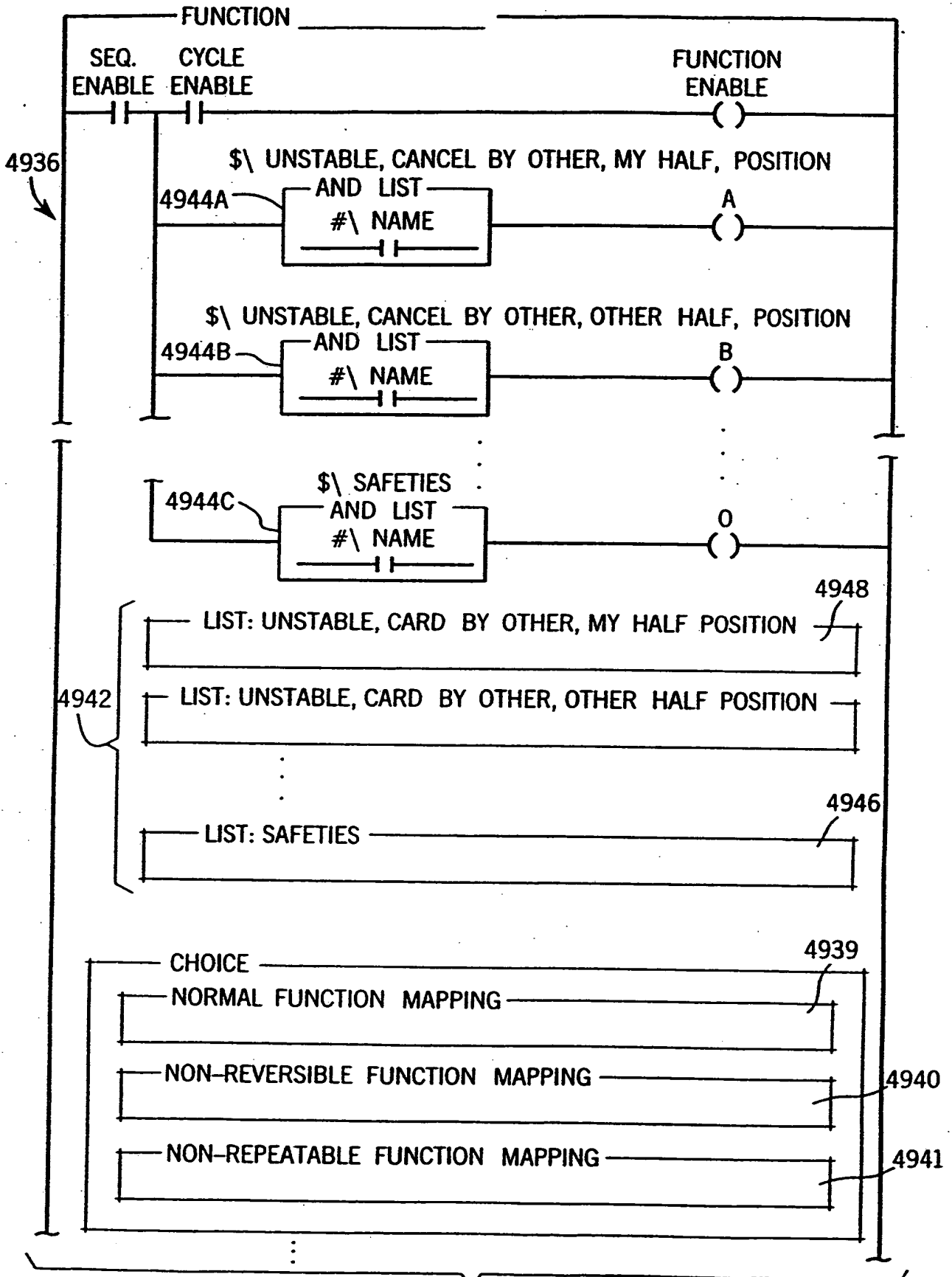


FIG. 48



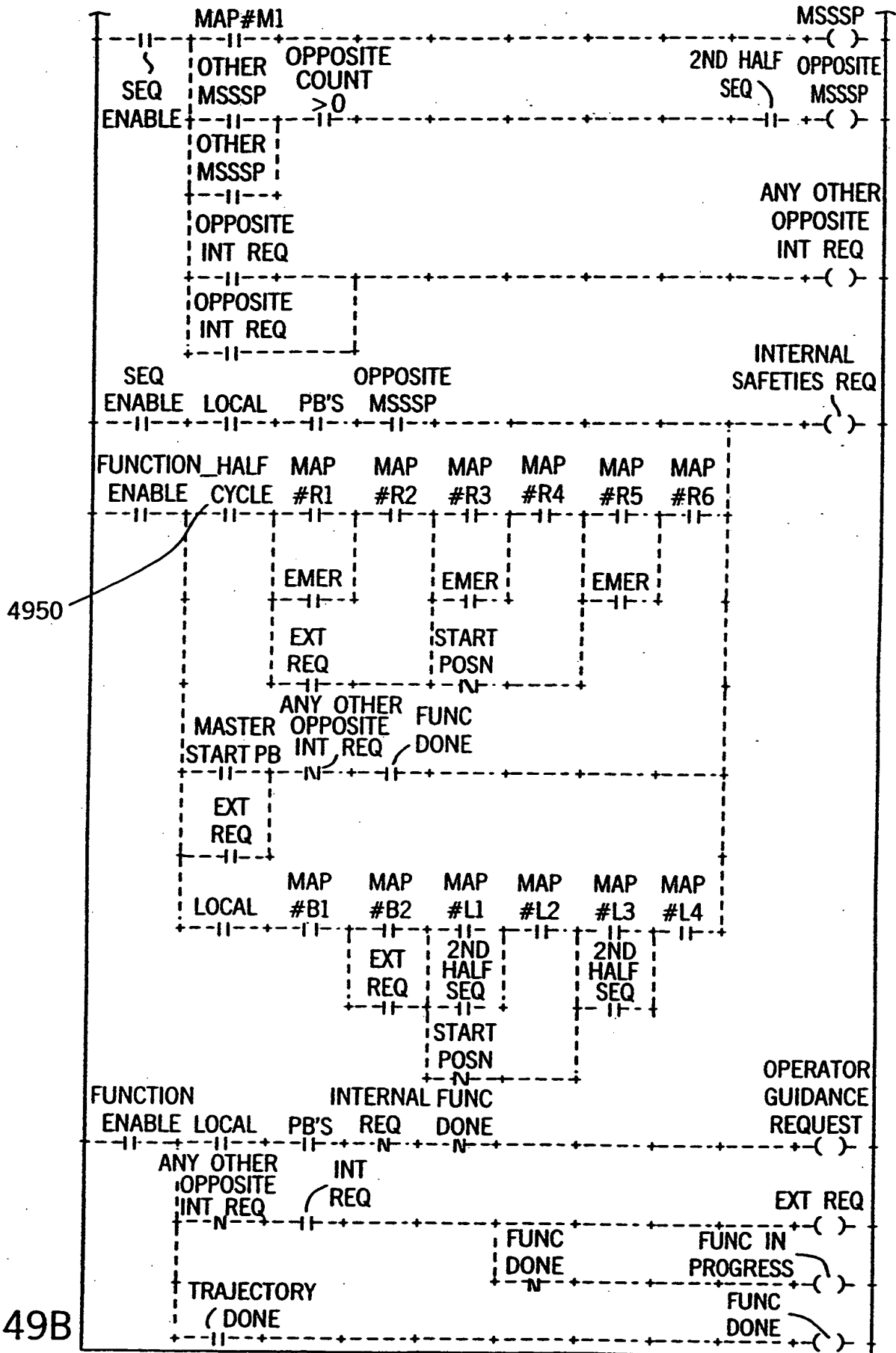


FIG. 49B

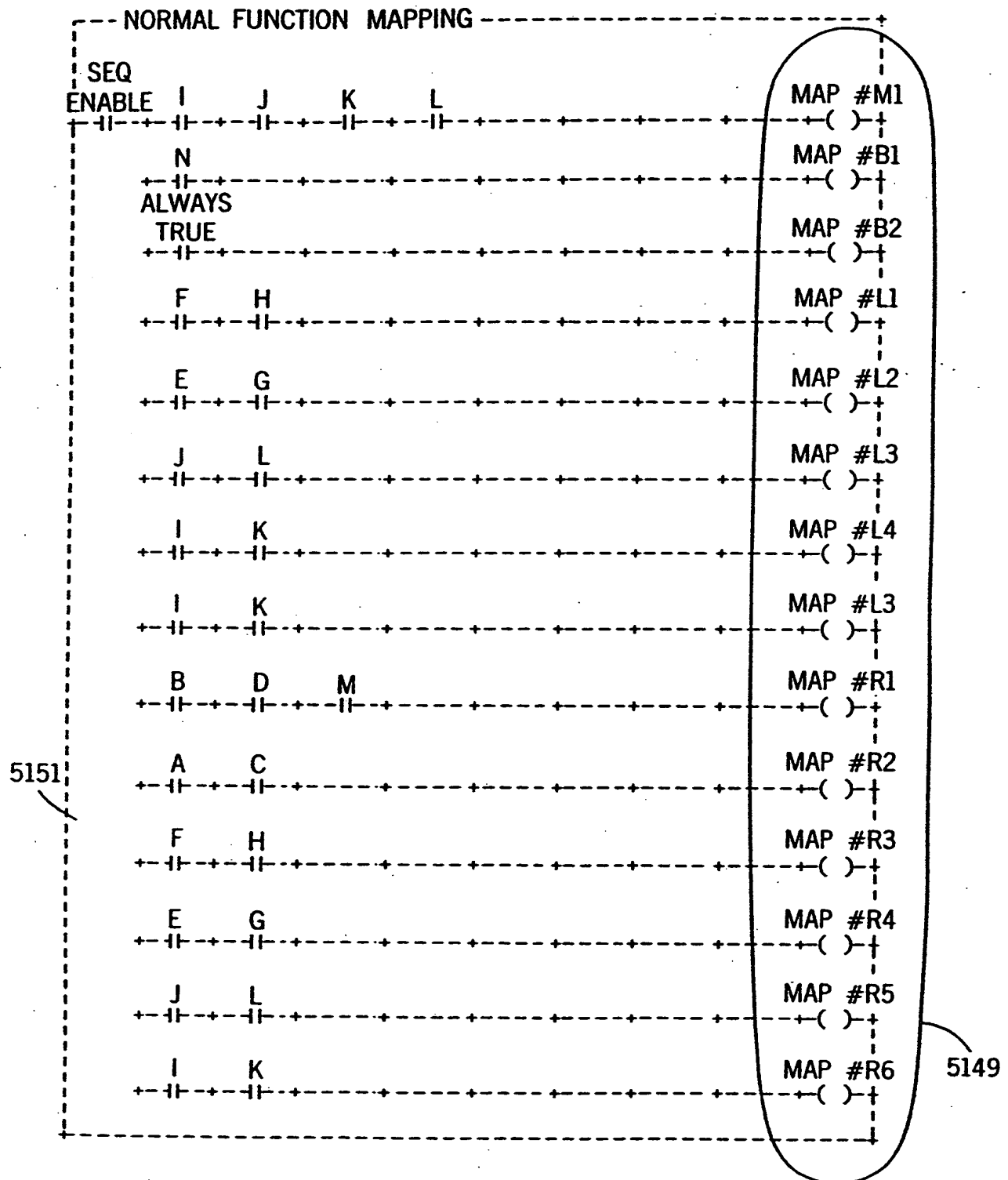
5032

ATTRIBUTES	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
STABLE									X	X	X	X			
UNSTABLE	X	X	X	X	X	X	X	X							
CANC BY OTHER	X	X	X	X	X										
CANC BY ME					X	X	X	X							
MY HALF OF CYC	X		X		X		X		X		X				
OTHER HALF		X		X		X		X		X		X			
POSITION	X	X			X	X			X	X					
LATCH			X	X			X	X			X	X			
MY START POS													X		
PUSH BUTTON														X	
SAFETY															X

5031

FIG. 50

FIG. 51



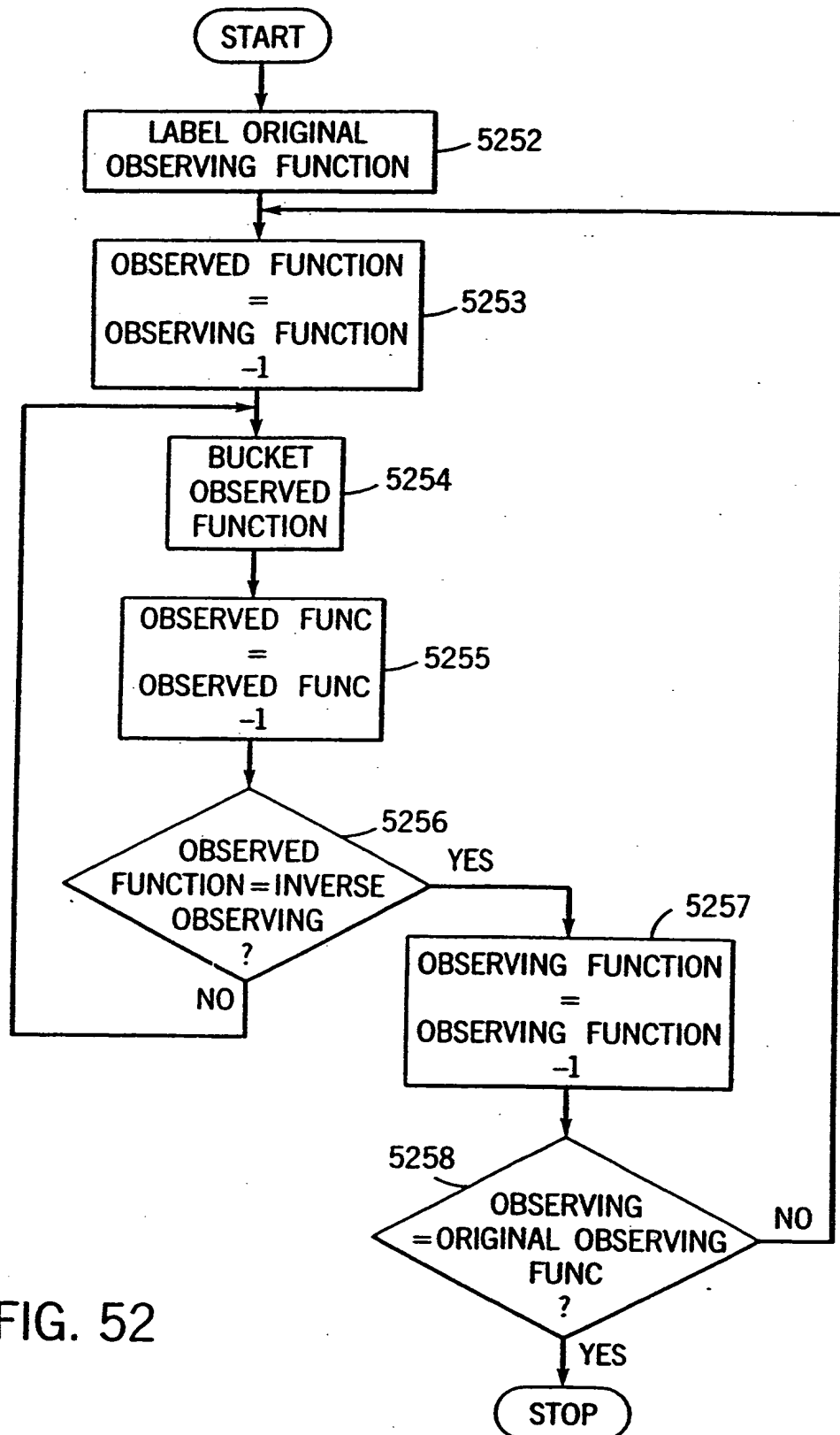
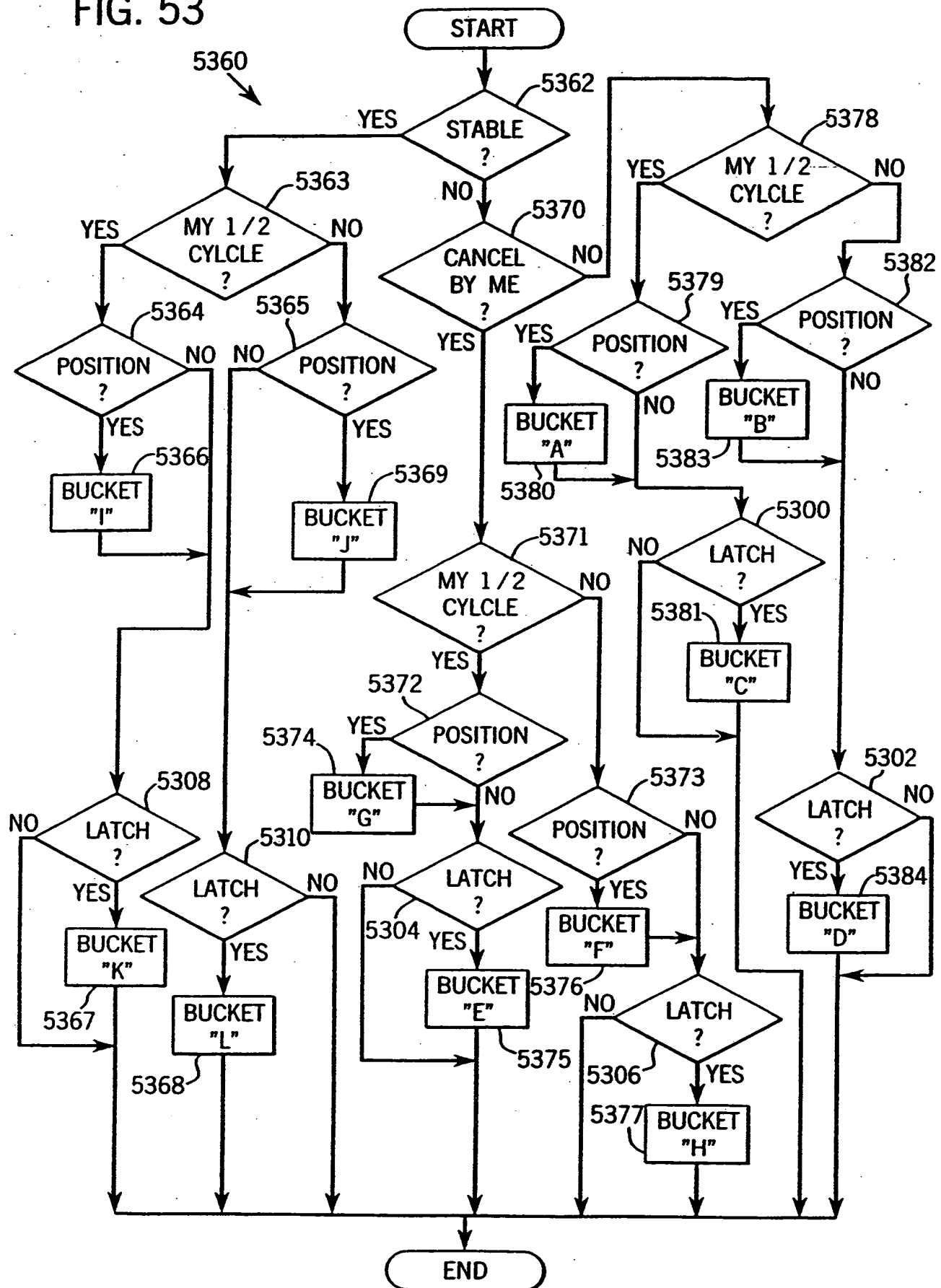


FIG. 52

FIG. 53



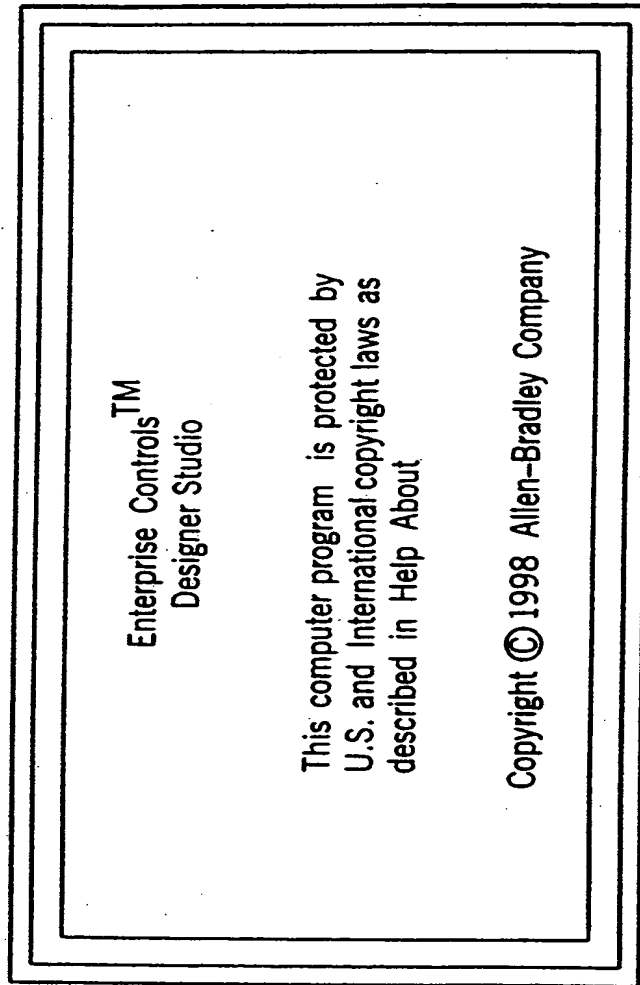


FIG. 54

FIG. 55

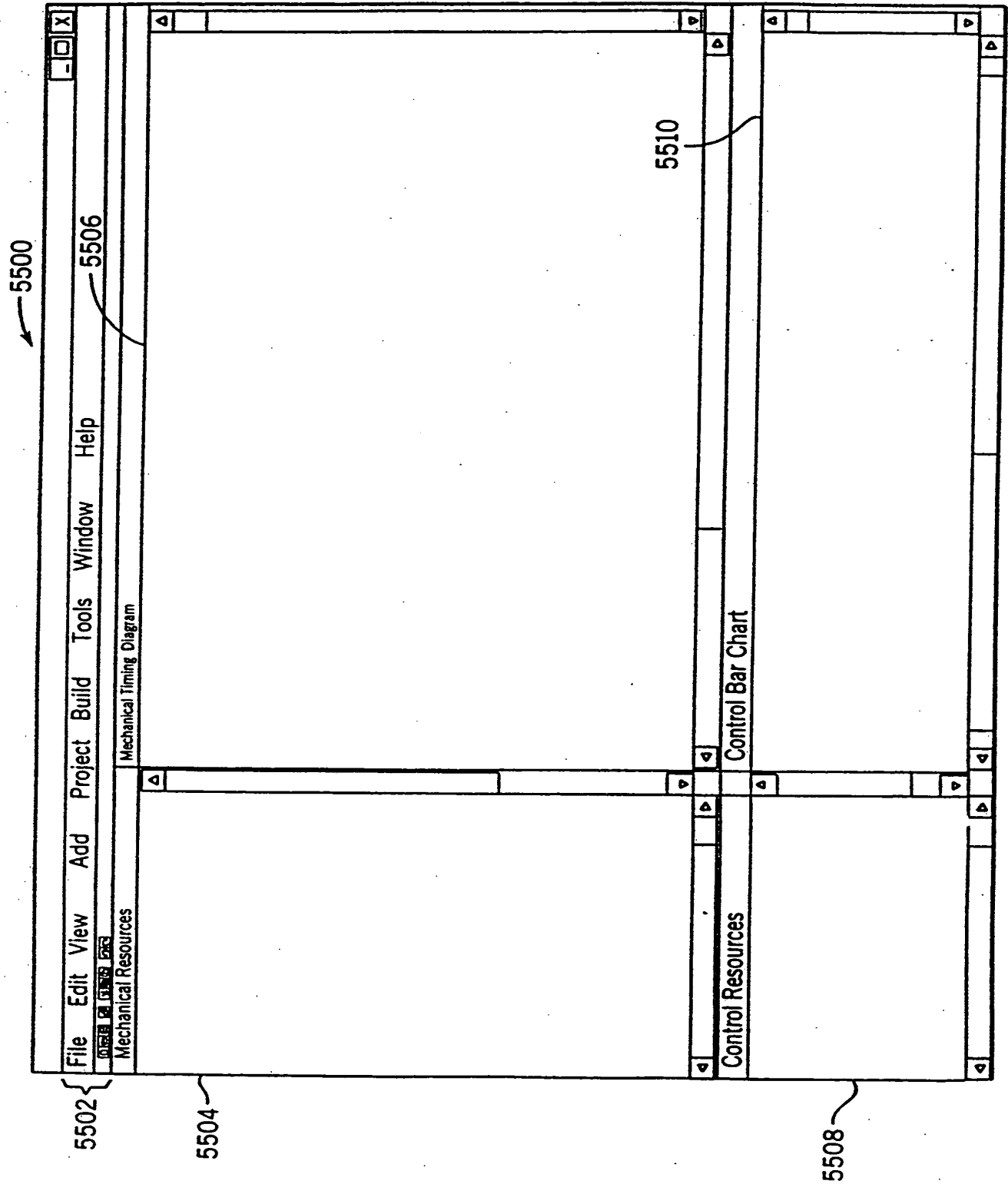


FIG. 56

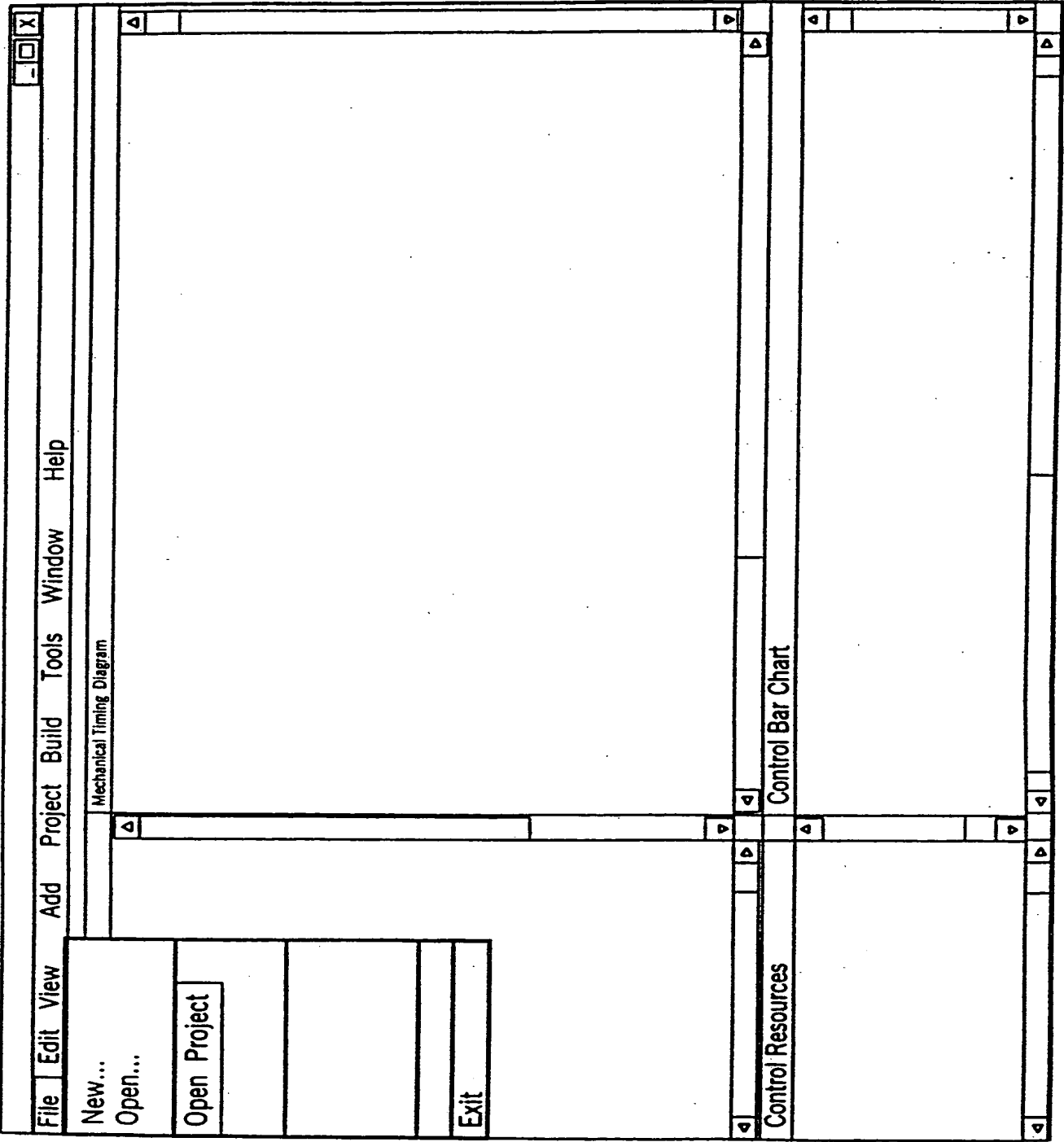


FIG. 57

5500

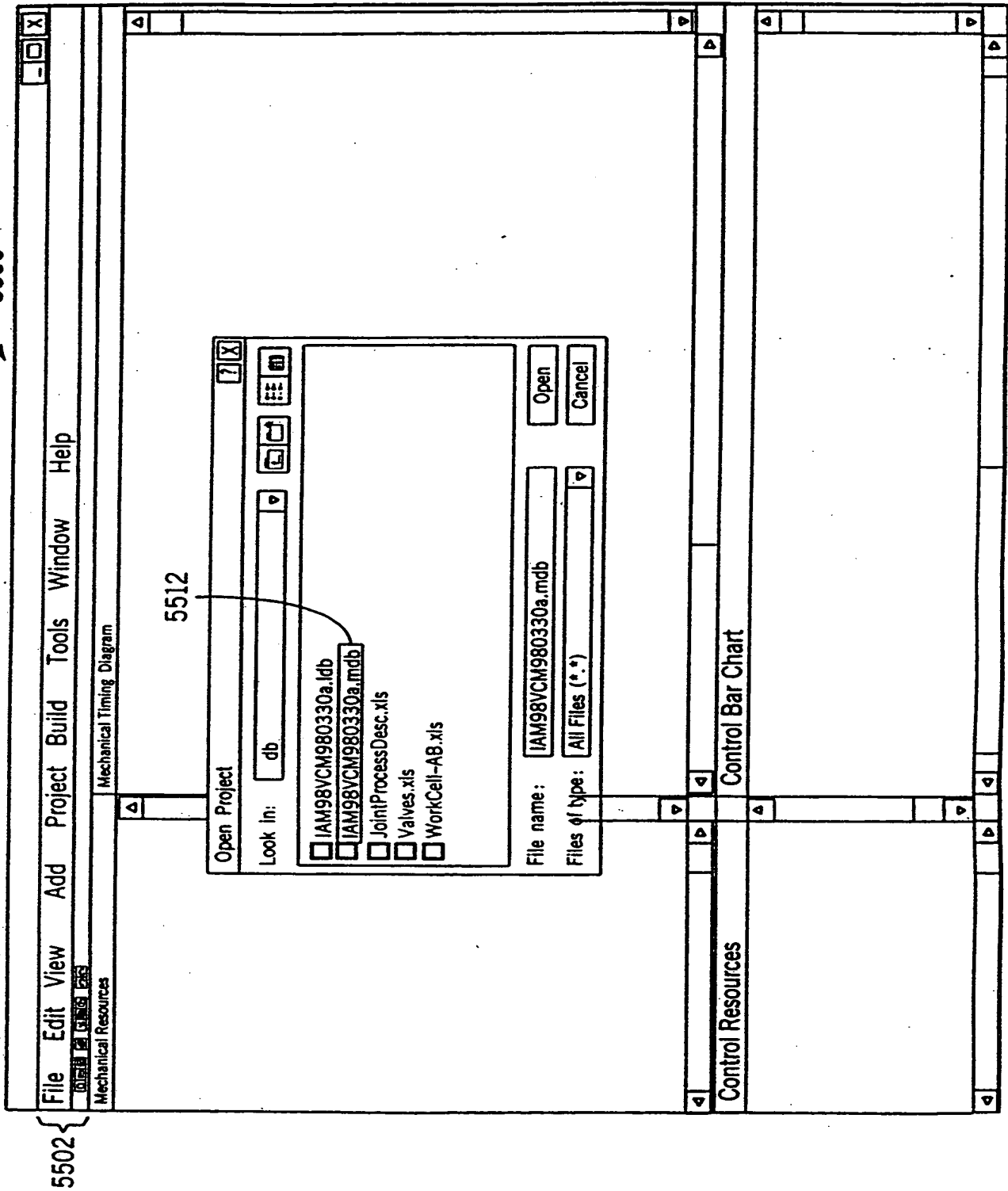


FIG. 58

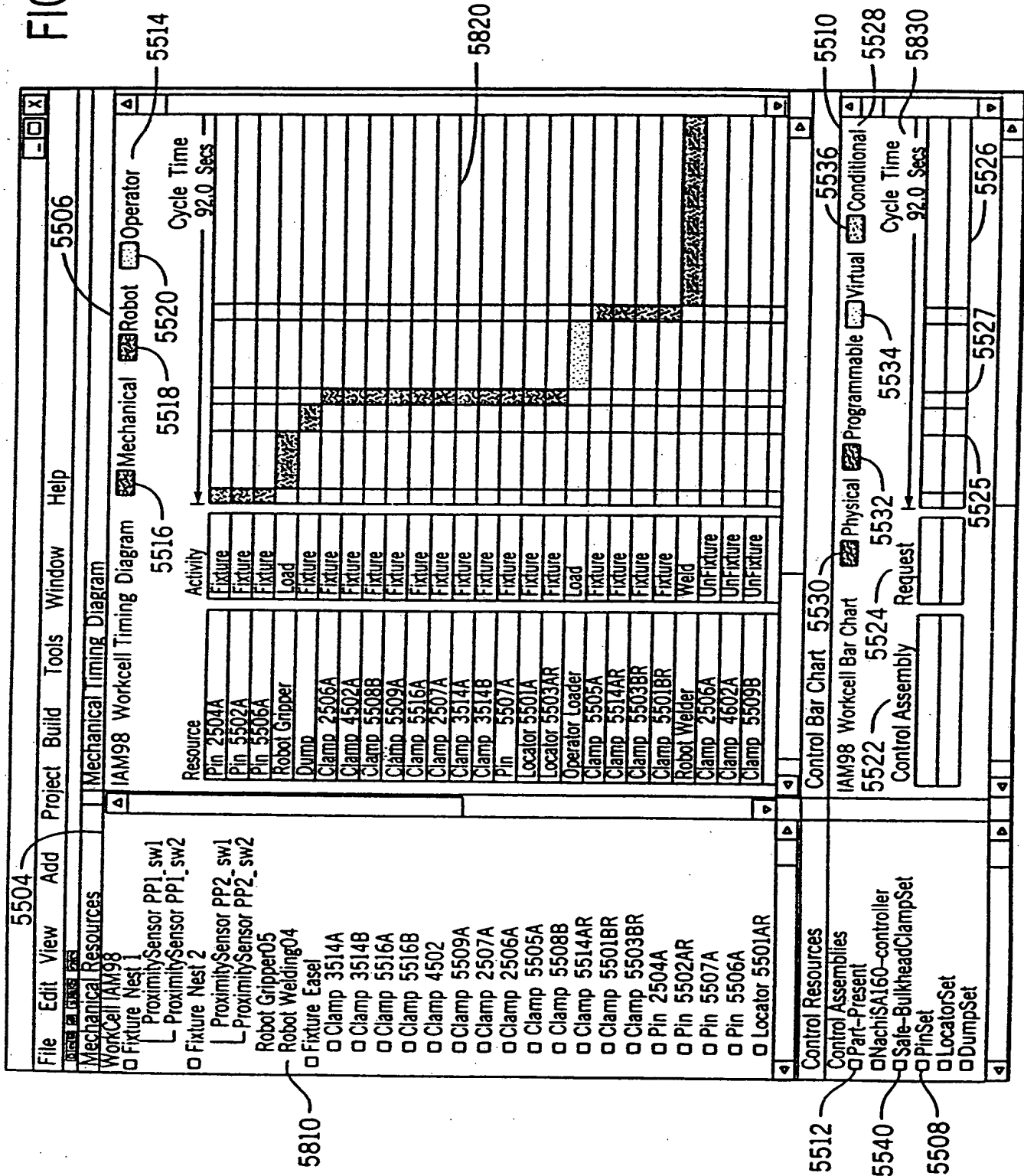
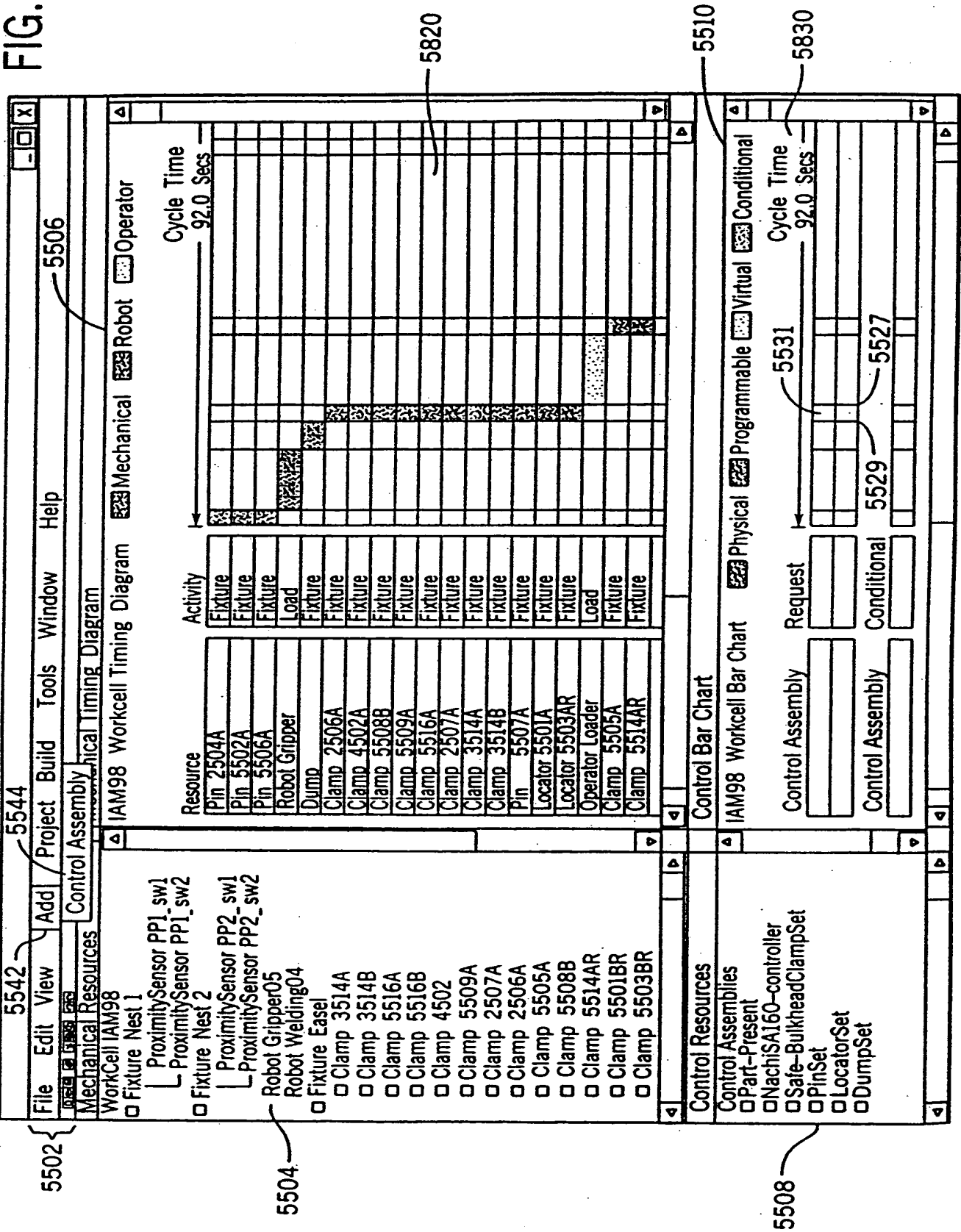


FIG. 59



5508

FIG. 61

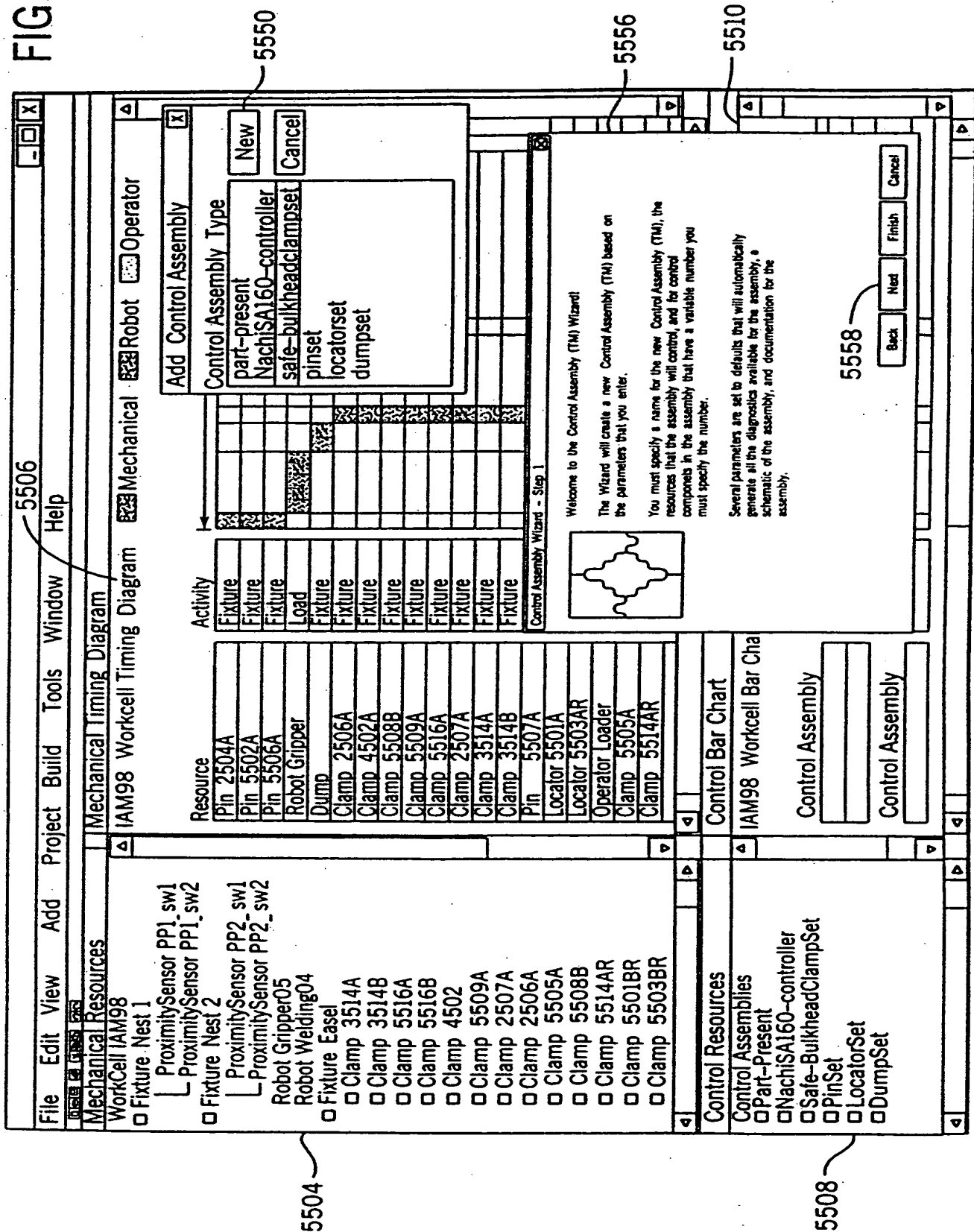


FIG. 62

File Edit View Add Project Build Tools Window Help

Mechanical Resources

WorkCell IAM98

- ☐ Fixture Nest 1
 - ☐ ProximitySensor PP1_sw1
 - ☐ ProximitySensor PP1_sw2
- ☐ Fixture Nest 2
 - ☐ ProximitySensor PP2_sw1
 - ☐ ProximitySensor PP2_sw2
- ☐ Robot Gripper05
- ☐ Robot Welding04
- ☐ Fixture Easel
 - ☐ Clamp 3514A
 - ☐ Clamp 3514B
 - ☐ Clamp 5516A
 - ☐ Clamp 5516B
 - ☐ Clamp 4502
 - ☐ Clamp 5509A
 - ☐ Clamp 2507A
 - ☐ Clamp 2506A
 - ☐ Clamp 5505A
 - ☐ Clamp 5508B
 - ☐ Clamp 5514AR
 - ☐ Clamp 5501BR
 - ☐ Clamp 5503BR

Mechanical Timing Diagram

IAM98 Workcell Timing Diagram

Resource	Activity
Pin 2504A	Fixture
Pin 5502A	Fixture
Pin 5506A	Fixture
Robot Gripper	Load
Dump	Fixture
Clamp 2506A	Fixture
Clamp 4502A	Fixture
Clamp 5508B	Fixture
Clamp 5509A	Fixture
Clamp 5516A	Fixture
Clamp 2507A	Fixture
Clamp 3514A	Fixture
Clamp 3514B	Fixture
Pin 5507A	Fixture
Locator 5501A	Fixture
Locator 5503AR	Fixture
Operator Loader	Fixture
Clamp 5505A	Fixture
Clamp 5514AR	Fixture

Add Control Assembly

Control Assembly Type

part-present
NachiSA160-controller
safe-bulkheadclampset
pinset
locatorset
dumpset

New Cancel

Control Assembly Wizard - Step 2 of 5

Control Assembly Type:
safe-bulkheadclampset

Specify name for the new Control Assembly

5564

5562

5566

5568

5570

5572

5574

5558

5576

☒ Create HMI for the assembly
☒ Create Simulation tools for the assembly
☒ Create Wiring Diagram for the assembly
☒ Create all available Diagnostics for the assembly
☒ Create Documentation for the assembly

Back Next Finish Cancel

Control Bar Chart

IAM98 Workcell Bar Chart

Control Assembly

Control Assembly

Control Resources

Control Assemblies

- ☐ Part-Present
- ☐ NachiSA160-controller
- ☐ Safe-BulkheadClampSet
- ☐ PinSet
- ☐ LocatorSet
- ☐ DumpSet

FIG. 63

File Edit View Add Project Build Tools Window Help

Mechanical Resources

WorkCell IAM98

- Fixture Nest 1
 - ProximitySensor PP1_sw1
 - ProximitySensor PP1_sw2
- Fixture Nest 2
 - ProximitySensor PP2_sw1
 - ProximitySensor PP2_sw2
- Robot Gripper05
- Robot Welding04
- Fixture Easel
 - Clamp 3514A
 - Clamp 3514B
 - Clamp 5516A
 - Clamp 5516B
 - Clamp 4502
 - Clamp 5509A
 - Clamp 2507A
 - Clamp 2506A
 - Clamp 5505A
 - Clamp 5508B
 - Clamp 5514AR
 - Clamp 5501BR
 - Clamp 5503BR

Mechanical Timing Diagram

IAM98 Workcell Timing Diagram

Resource	Activity
Pin 2504A	Fixture
Pin 5502A	Fixture
Pin 5506A	Fixture
Robot Gripper	Load
Dump	Fixture
Clamp 2506A	Fixture
Clamp 4502A	Fixture
Clamp 5508B	Fixture
Clamp 5509A	Fixture
Clamp 5516A	Fixture
Clamp 2507A	Fixture
Clamp 3514A	Fixture
Clamp 3514B	Fixture
Pin 5507A	Fixture
Locator 5501A	Fixture
Locator 5503AR	Fixture
Operator Loader	Fixture
Clamp 5505A	Fixture
Clamp 5514AR	Fixture

Control Resources

Control Assemblies

- Part-Present
- NachiSA160-controller
- Safe-BulkheadClampSet
- PinSet
- LocatorSet
- DumpSet

Control Bar Chart

IAM98 Workcell Bar Chart

Control Assembly

Control Assembly

Control Assembly Wizard - Step 2 of 5

Control Assembly Type: safe-bulkheadclampset

Specify name for the new Control Assembly

5564

5578

5558

Back Next Finish Cancel

☐ Create Wire Diagram for the Assembly
☐ Create all available Diagnostics for the assembly
☐ Create Documentation for the assembly

Add Control Assembly
 Control Assembly Type
 part-present
 NachiSA160-controller
 safe-bulkheadclampset
 pinset
 locatorset
 dumpset
 New
 Cancel

FIG. 64

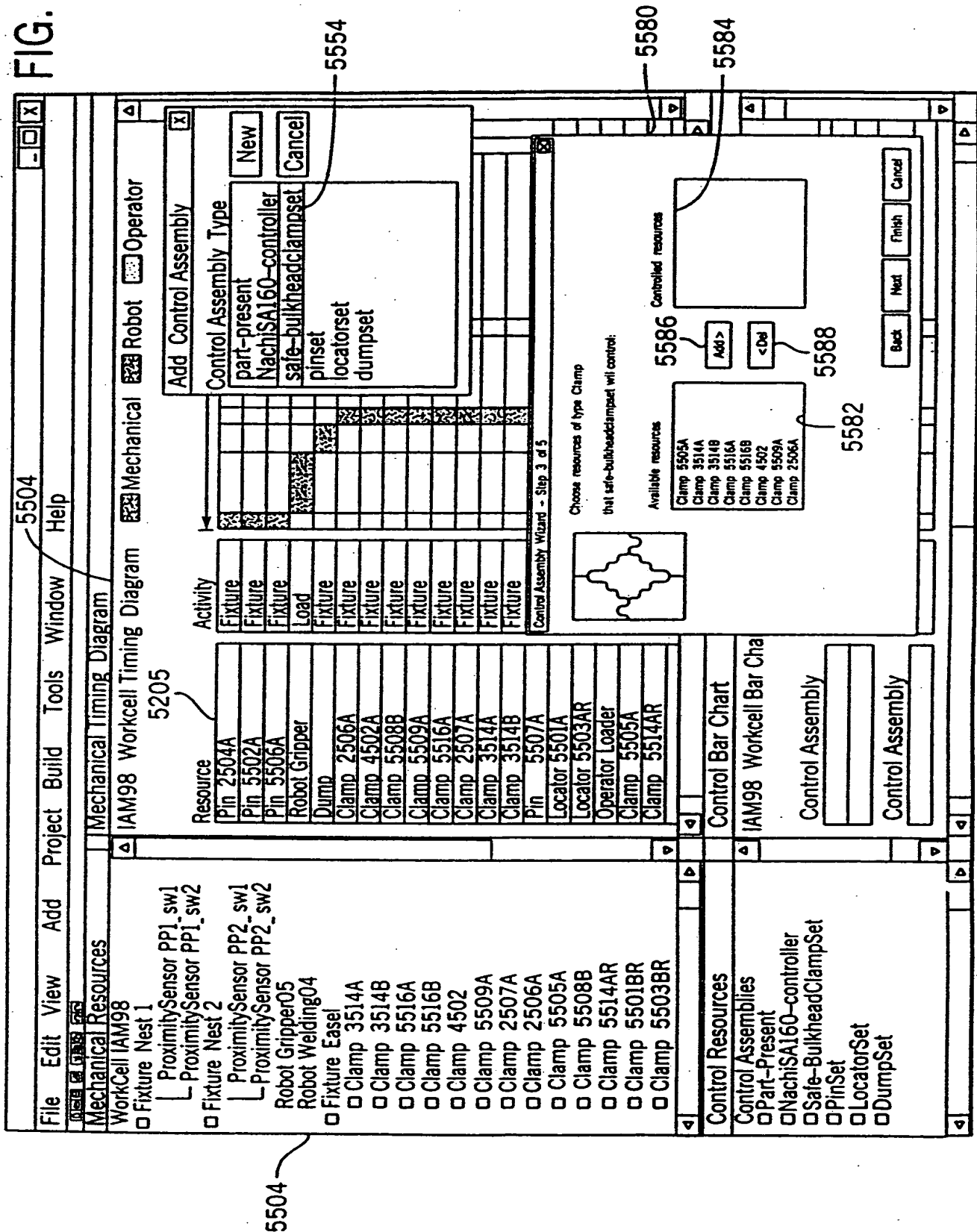


FIG. 65

File Edit View Add Project Build Tools Window Help

Mechanical Resources

WorkCell IAM98

☐ Fixture Nest 1

☐ ProximitySensor PP1_sw1

☐ ProximitySensor PP1_sw2

☐ Fixture Nest 2

☐ ProximitySensor PP2_sw1

☐ ProximitySensor PP2_sw2

☐ Robot Gripper05

☐ Robot Welding04

☐ Fixture Easel

☐ Clamp 3514A

☐ Clamp 3514B

☐ Clamp 5516A

☐ Clamp 5516B

☐ Clamp 4502

☐ Clamp 5509A

☐ Clamp 2507A

☐ Clamp 2506A

☐ Clamp 5505A

☐ Clamp 5508B

☐ Clamp 5514AR

☐ Clamp 5501BR

☐ Clamp 5503BR

Control Resources

Control Assemblies

☐ Part-Present

☐ NachiSA160-controller

☐ Safe-BulkheadClampSet

☐ PinSet

☐ LocatorSet

☐ DumpSet

Mechanical Timing Diagram

IAM98 Workcell Timing Diagram

Activity

Fixture

Fixture

Fixture

Load

Fixture

Fixture

Fixture

Fixture

Fixture

Fixture

Fixture

Fixture

Resource

Pin 2504A

Pin 5502A

Pin 5506A

Robot Gripper

Dump

Clamp 2506A

Clamp 4502A

Clamp 5508B

Clamp 5509A

Clamp 5516A

Clamp 2507A

Clamp 3514A

Clamp 3514B

Pin 5507A

Locator 5501A

Locator 5503AR

Operator Loader

Clamp 5505A

Clamp 5514AR

Control Assembly Wizard - Step 3 of 5

Add Control Assembly

Control Assembly Type

part-present

NachiSA160-controller

safe-bulkheadclampset

pinset

locatorset

dumpset

New

Cancel

Choose resources of type Clamp that safe-bulkheadclampset will control:

Available resources

Clamp 5505A

Clamp 3514A

Clamp 3514B

Clamp 5514AR

Clamp 5501BR

Clamp 5503BR

Clamp 2507A

Controlled resources

Clamp 2506A

Clamp 4502

Clamp 5508B

Clamp 5509A

5590

5592

5594

5596

5582

5588

5598

5599

5594

5584

5558

5596

5598

5558

Back

Next

Finish

Cancel

Control Bar Chart

IAM98 Workcell Bar Cha

Control Assembly

Control Assembly

FIG. 66

File Edit View Add Project Build Tools Window Help

Mechanical Resources

WorkCell IAM98

- ☐ Fixture Nest 1
 - ☐ ProximitySensor PP1_sw1
 - ☐ ProximitySensor PP1_sw2
- ☐ Fixture Nest 2
 - ☐ ProximitySensor PP2_sw1
 - ☐ ProximitySensor PP2_sw2
- Robot Gripper05
- Robot Welding04
- ☐ Fixture Easel
 - ☐ Clamp 3514A
 - ☐ Clamp 3514B
 - ☐ Clamp 5516A
 - ☐ Clamp 5516B
 - ☐ Clamp 4502
 - ☐ Clamp 5509A
 - ☐ Clamp 2507A
 - ☐ Clamp 2506A
 - ☐ Clamp 5505A
 - ☐ Clamp 5508B
 - ☐ Clamp 5514AR
 - ☐ Clamp 5501BR
 - ☐ Clamp 5503BR

Mechanical Timing Diagram

IAM98 Workcell Timing Diagram

Robot Operator

Activity

Resource	Activity
Pin 2504A	Fixture
Pin 5502A	Fixture
Pin 5506A	Fixture
Robot Gripper	Load
Dump	Fixture
Clamp 2506A	Fixture
Clamp 4502A	Fixture
Clamp 5508B	Fixture
Clamp 5509A	Fixture
Clamp 5516A	Fixture
Clamp 2507A	Fixture
Clamp 3514A	Fixture
Clamp 3514B	Fixture
Pin 5507A	Fixture
Locator 5501A	Fixture
Locator 5503AR	Fixture
Operator Loader	Fixture
Clamp 5505A	Fixture
Clamp 5514AR	Fixture

Control Assembly Wizard - Step 4 of 5

Control Assembly Type

part-present
NachISA160-controller
safe-bulkheadclampset
pinset
locatorset
dumpset

New Cancel

Test

Control Assembly contains the following control components (suggested labels are supplied; you may replace them as needed):

Label	Control Component	Type	Function
5590	Clamp 2506A	airvalve	single solenoid
5592	Clamp 4502	aircylinder	Cylindrical
5594	Clamp 5508B	aircylinder	Cylindrical
5596	Clamp 5509A	aircylinder	Cylindrical
5609	5611 5613 5615	double solenoid	main control
5617			safety valve
5621			air-motion coverter
5619			air-motion coverter
5623			air-motion coverter
5558			air-motion coverter

Control Bar Chart

IAM98 Workcell Bar Chart

Control Assembly

Control Assembly

[illegible]

FIG. 68

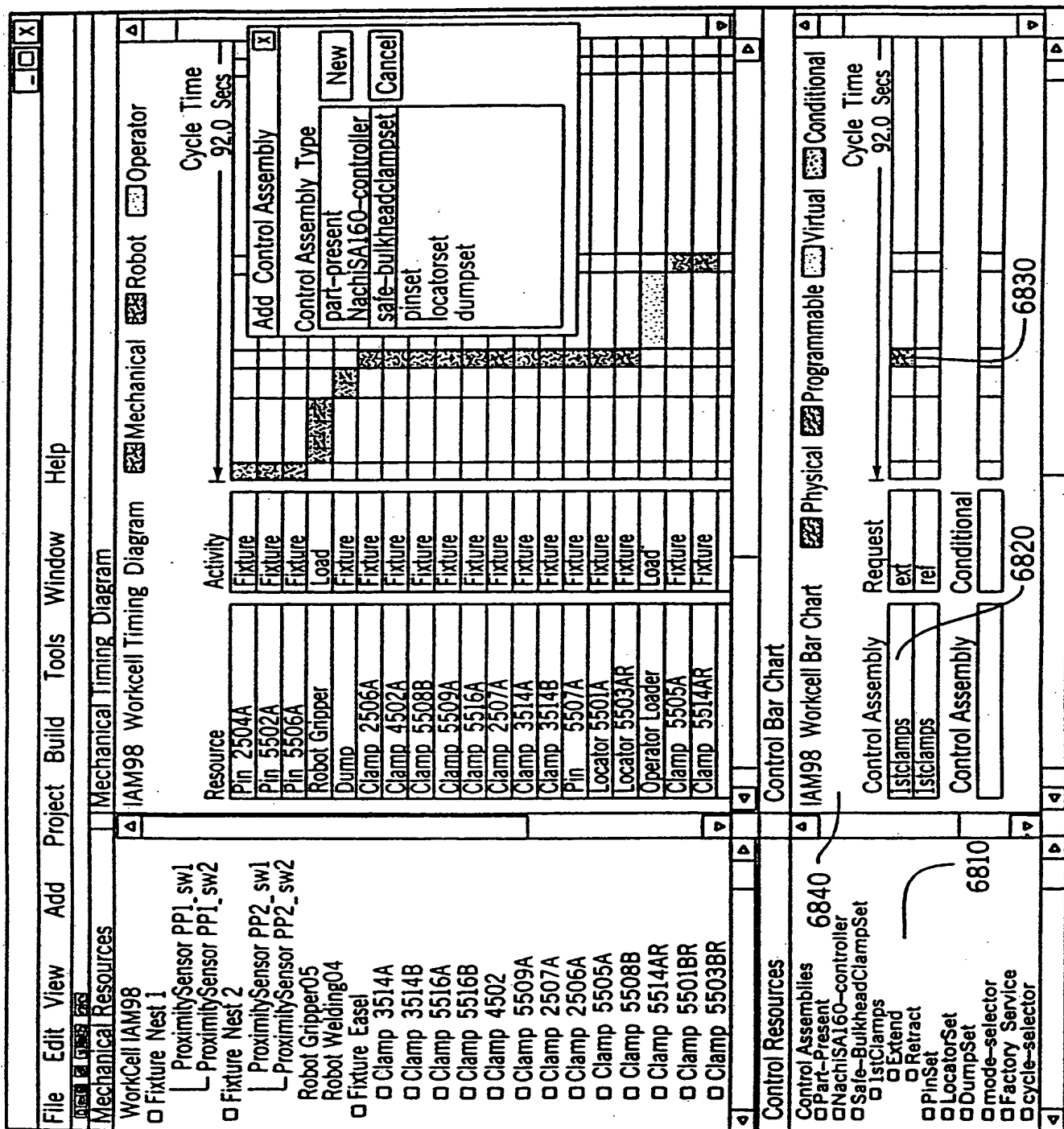


FIG. 1

File Edit View Add Project Build Tools Window Help

Mechanical Resources

WorkCell IAM98

□ Fixture Nest 1

□ ProximitySensor PP1_sw1

□ ProximitySensor PP1_sw2

□ Fixture Nest 2

□ ProximitySensor PP2_sw1

□ ProximitySensor PP2_sw2

Robot Gripper05

Robot Welding04

□ Fixture Easel

□ Clamp 3514A

□ Clamp 3514B

□ Clamp 5516A

□ Clamp 5516B

□ Clamp 4502

□ Clamp 5509A

□ Clamp 2507A

□ Clamp 2506A

□ Clamp 5505A

□ Clamp 5508B

□ Clamp 5514AR

□ Clamp 5501BR

□ Clamp 5503BR

Mechanical Timing Diagram

IAM98 Workcell Timing Diagram

Resource

Pin 2504A

Pin 5502A

Pin 5506A

Robot Gripper

Dump

Clamp 2506A

Clamp 4502A

Clamp 5508B

Clamp 5509A

Clamp 5516A

Clamp 2507A

Clamp 3514A

Clamp 3514B

Pin 5507A

Locator 5501A

Locator 5503AR

Operator Loader

Clamp 5505A

Clamp 5514AR

Activity

Fixture

Fixture

Fixture

Load

Fixture

Fixture

Fixture

Fixture

Fixture

Fixture

Fixture

Fixture

Fixture

Load

Fixture

Fixture

Control Bar Chart

IAM98 Workcell Bar Chart

Physical Programmable Virtual Conditional

5522 5524 7001 5531 5830

Control Assembly Request

ext

ret

Conditional

Control Assembly

Control Assembly

Control Resources

Control Assemblies

□ Part-Present

□ NachiSA160-controller

□ Safe-BulkheadClampSet

□ Extend

□ Retract

□ PinSet

□ LocatorSet

□ DumpSet

□ mode-selector

□ Factory Service

□ cycle-selector

6911 6913 6910 6920

[illegible]

FIG. 71

FIG. 71 is a screenshot of a software interface for configuring a simulation. The interface is divided into several panes and sections.

Top Menu Bar: File, Edit, View, Add, Project, Build, Tools, Window, Help.

Left Pane (Mechanical View): Contains a tree view with the following items:

- Work Cell
 - Fixture Nest
 - Pr
 - Pr
 - Fixture Nest Complete
 - Pr
 - Pr
- Robot Gripper05
- Robot Welding04
- Fixture Easel
 - Clamp 3514A
 - Clamp 3514B
 - Clamp 5516A
 - Clamp 5516B
 - Clamp 4502
 - Clamp 5509A
 - Clamp 2507A
 - Clamp 2506A
 - Clamp 5505A
 - Clamp 5508B
 - Clamp 5514AR
 - Clamp 5501BR

Center Pane (Timing Diagram): A grid showing timing for various components. The components listed on the left are:

- 06A
- 02A
- 08B
- 09A
- 16A
- 07A
- 14A
- Clamp 3514B
- Pin 5507A
- Locator 5501A
- Locator 5503AR
- Operator Loader
- Clamp 5505A
- Clamp 5514AR
- Clamp 5503BR
- Clamp 5501BR
- RobotWelder
- Clamp 2506A
- Clamp 4502A
- Clamp 5508B
- Clamp 5509A
- Clamp 5516A
- Clamp 5516B
- Clamp 5505A

 The grid cells contain various patterns (dots, horizontal lines, vertical lines) representing timing data.

Right Pane (Control Bar Chart): Contains a section for "Control Bar Chart" with the following options:

- Physical
- Programmable
- Virtual
- Conditional

 Below this, there are fields for "Cycle Time" (92.0 Secs) and "Request" (ext, ret).

Bottom Pane (Control Resources): Contains a list of resources:

- Control Assemblies
 - Part-Present
 - NachiSA160-controller
 - Safe-BulkheadClampSet
 - 1stClamps
 - Extend
 - Retract
 - PinSet
 - LocatorSet
 - DumpSet
 - mode-selector
 - Factory Service

Annotations:

- 5548 points to the "Add Control Assembly" button.
- 5546 points to the "Control Assembly Type" dropdown menu.
- 5820 points to the "Timing Diagram" grid.
- 5830 points to the "Cycle Time" field.

FIG. 72

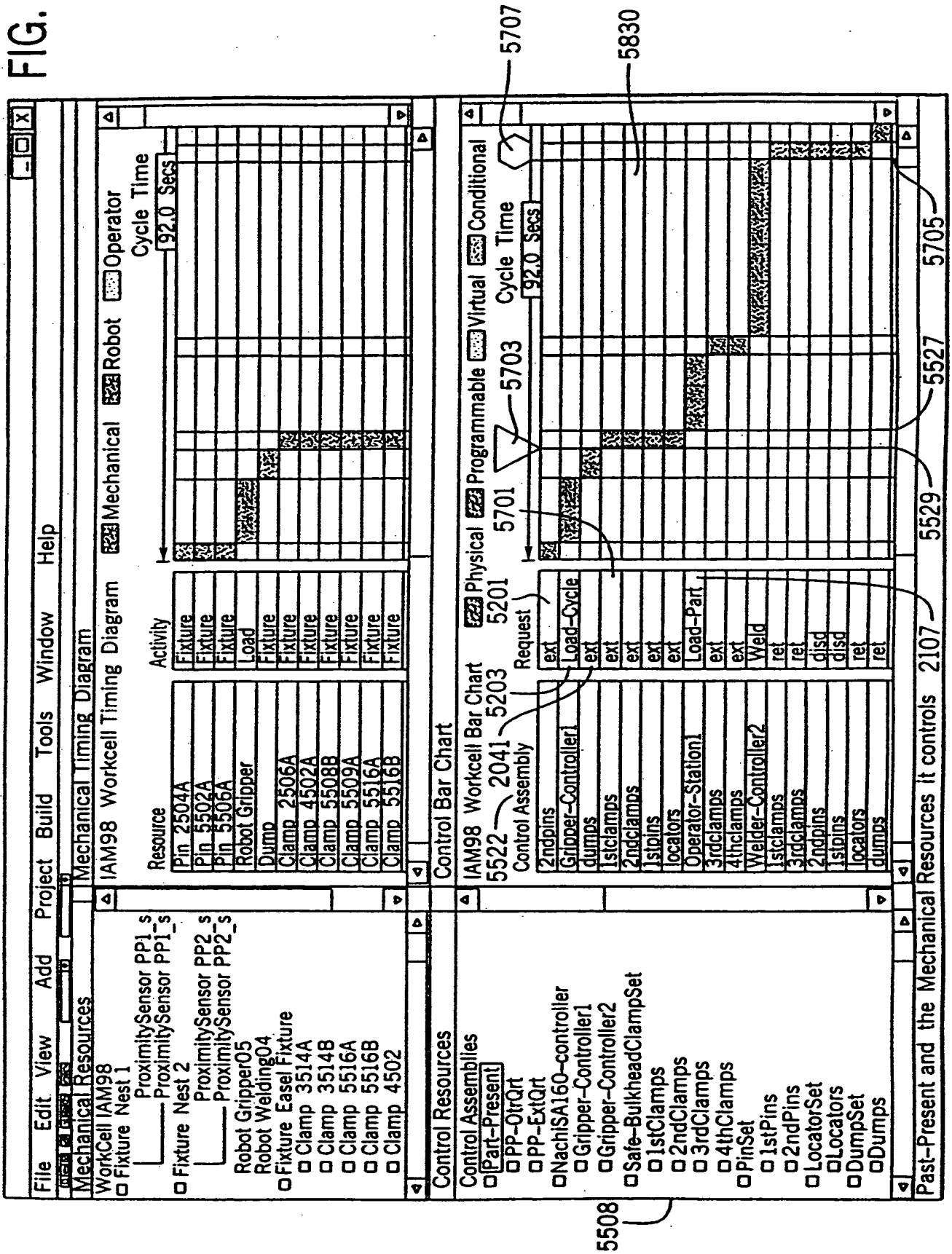


FIG. 73

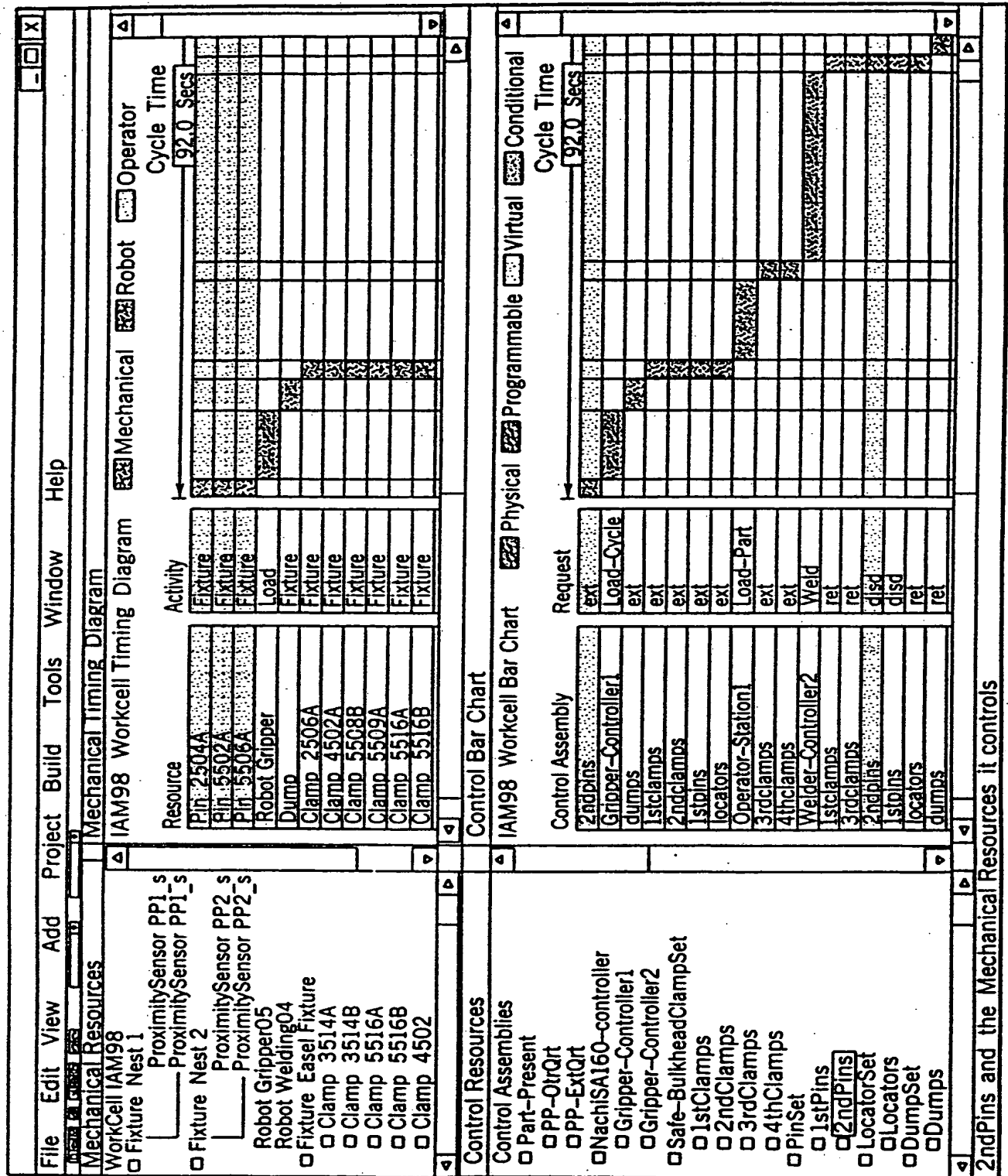


FIG. 74

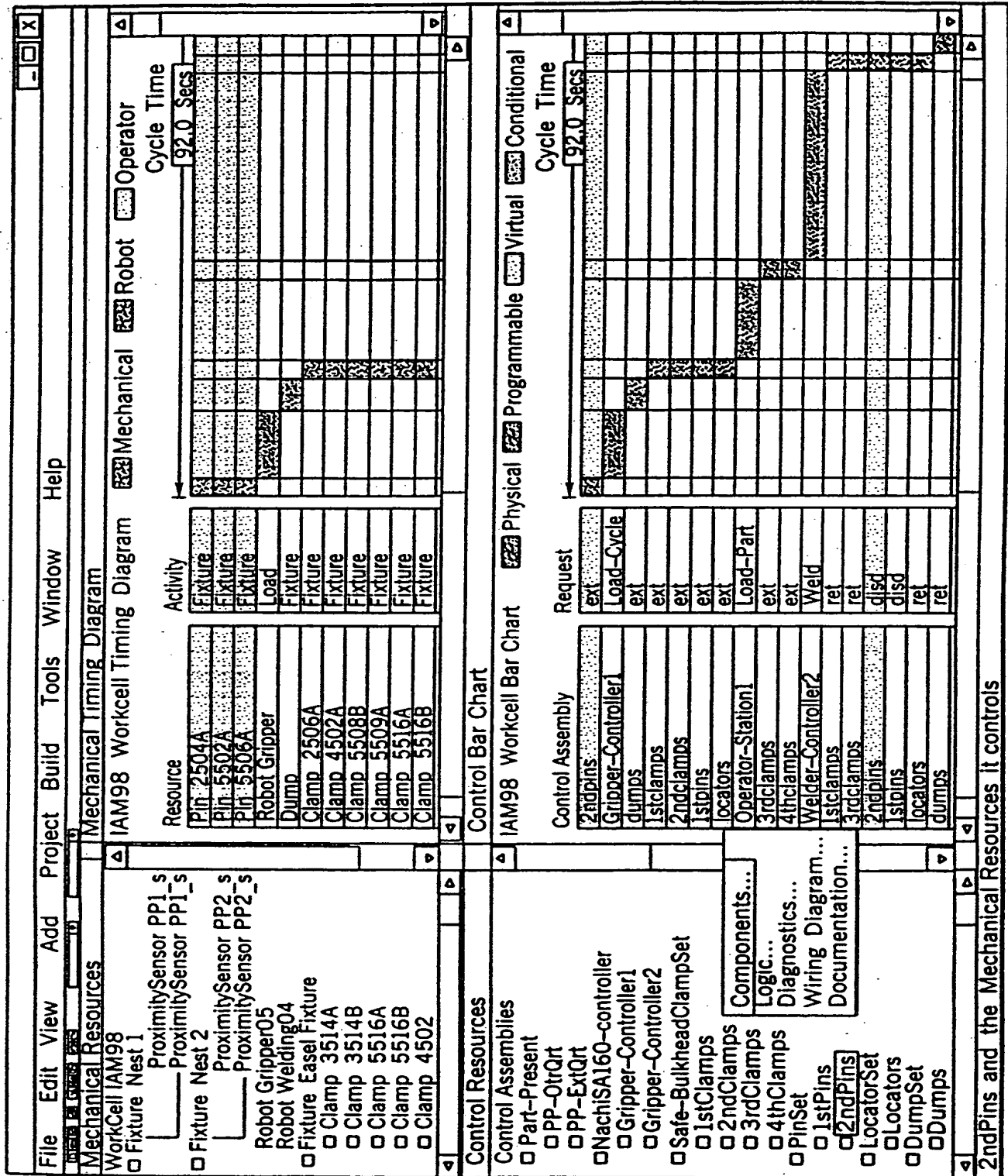


FIG. 75

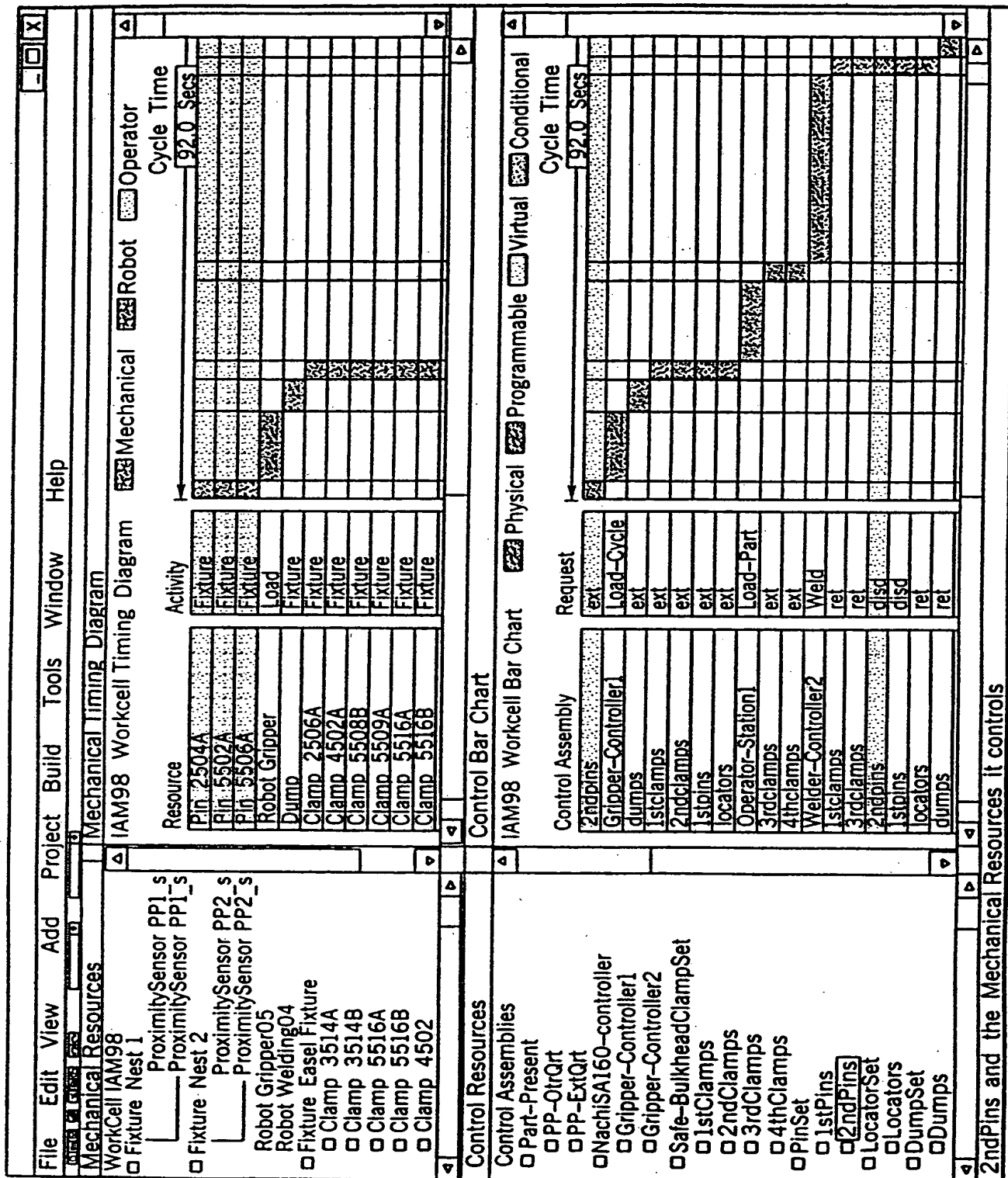


FIG. 76

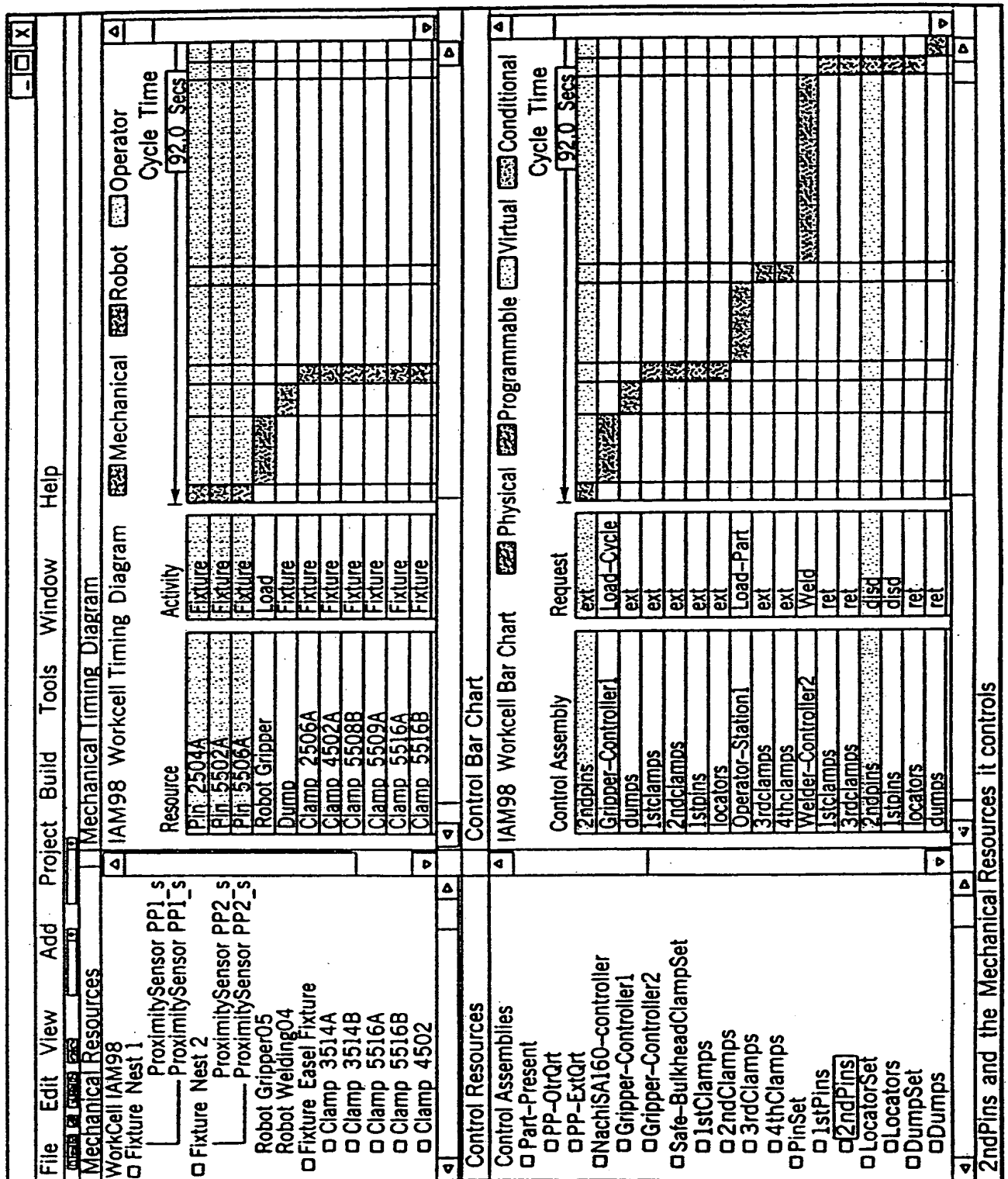
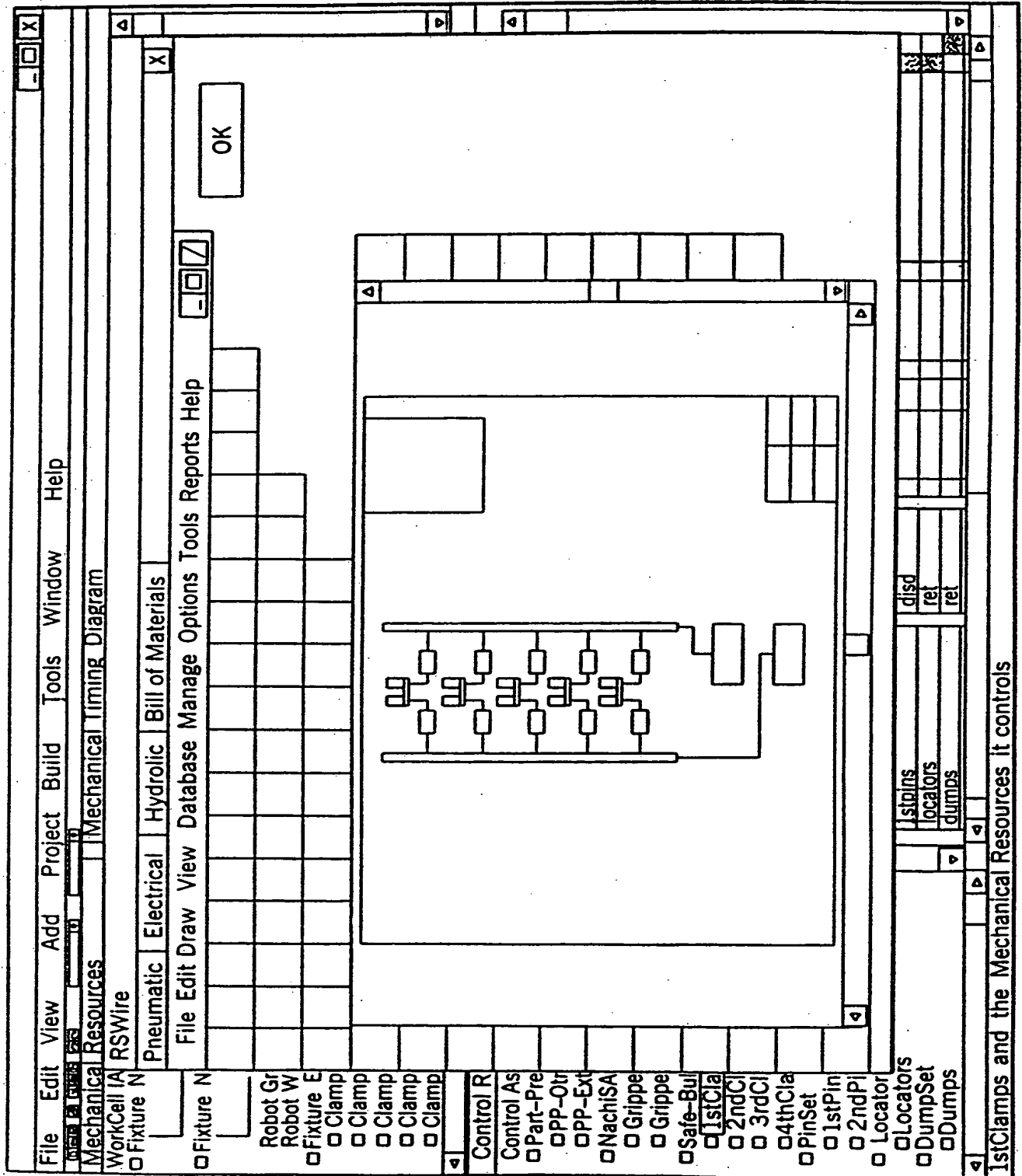
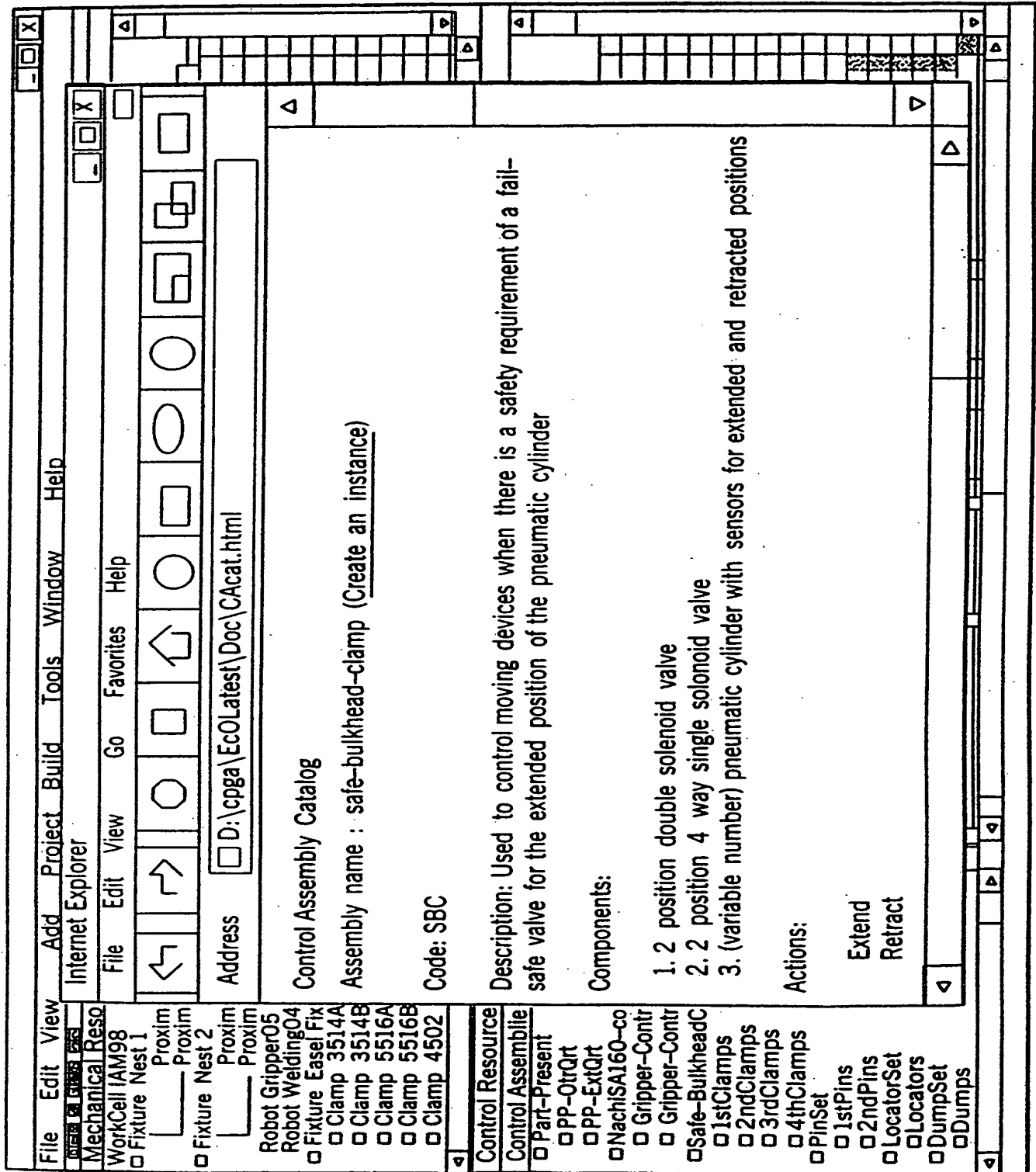


FIG. 77



The image is a screenshot of a web browser window. The title bar at the top reads "Internet Explorer". The menu bar includes "File", "Edit", "View", "Add", "Project", "Build", "Tools", "Window", and "Help". The address bar shows the URL "D:\cpga\EcOlatest\Doc\CAcat.html". The browser's toolbar contains various icons for navigation and file operations. The main content area displays the "Control Assembly Catalog" page. The page has a title "Control Assembly Catalog" and a description: "The automation control assembly catalog (CAC) contains a set of reusable types that are available within the enterprise-wide controls designer studio". Below this, there is a section titled "Catalog" which lists various components. The components are organized into two main categories: "Physical" and "pneumatic actuators". Under "Physical", there are two items: "Safe Bulkhead Clamp-control of clamps and other components which require a safety valve for extension / engagement" and "Dump (DMP)-control of heavy components such as dumps which need to hold position in the absence of control". Under "pneumatic actuators", there is one item: "Pin / Locator(PNLOC)-control of bins locators or other components which do not require special". The browser's status bar at the bottom shows the current page is "D:\cpga\EcOlatest\Doc\CAcat.html".

FIG. 79



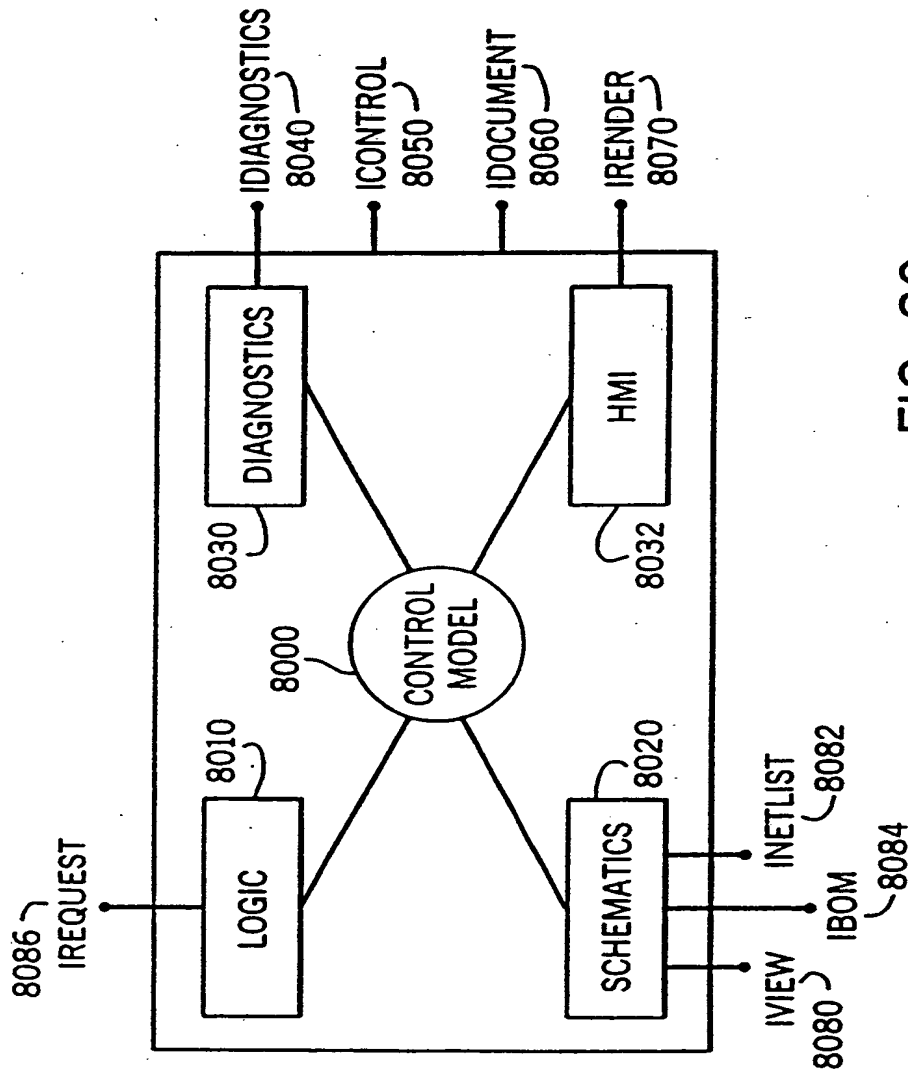


FIG. 80

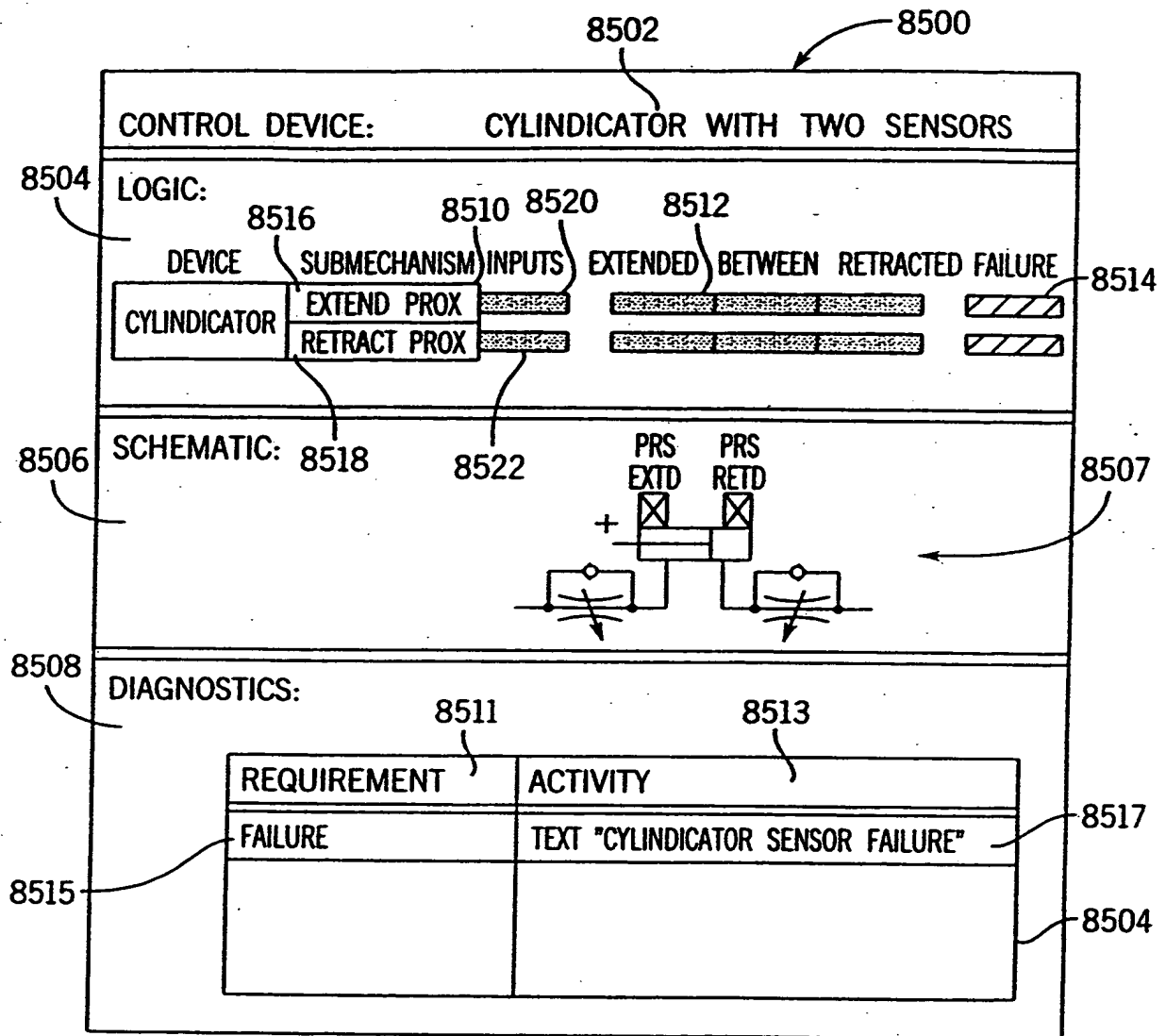


FIG. 81

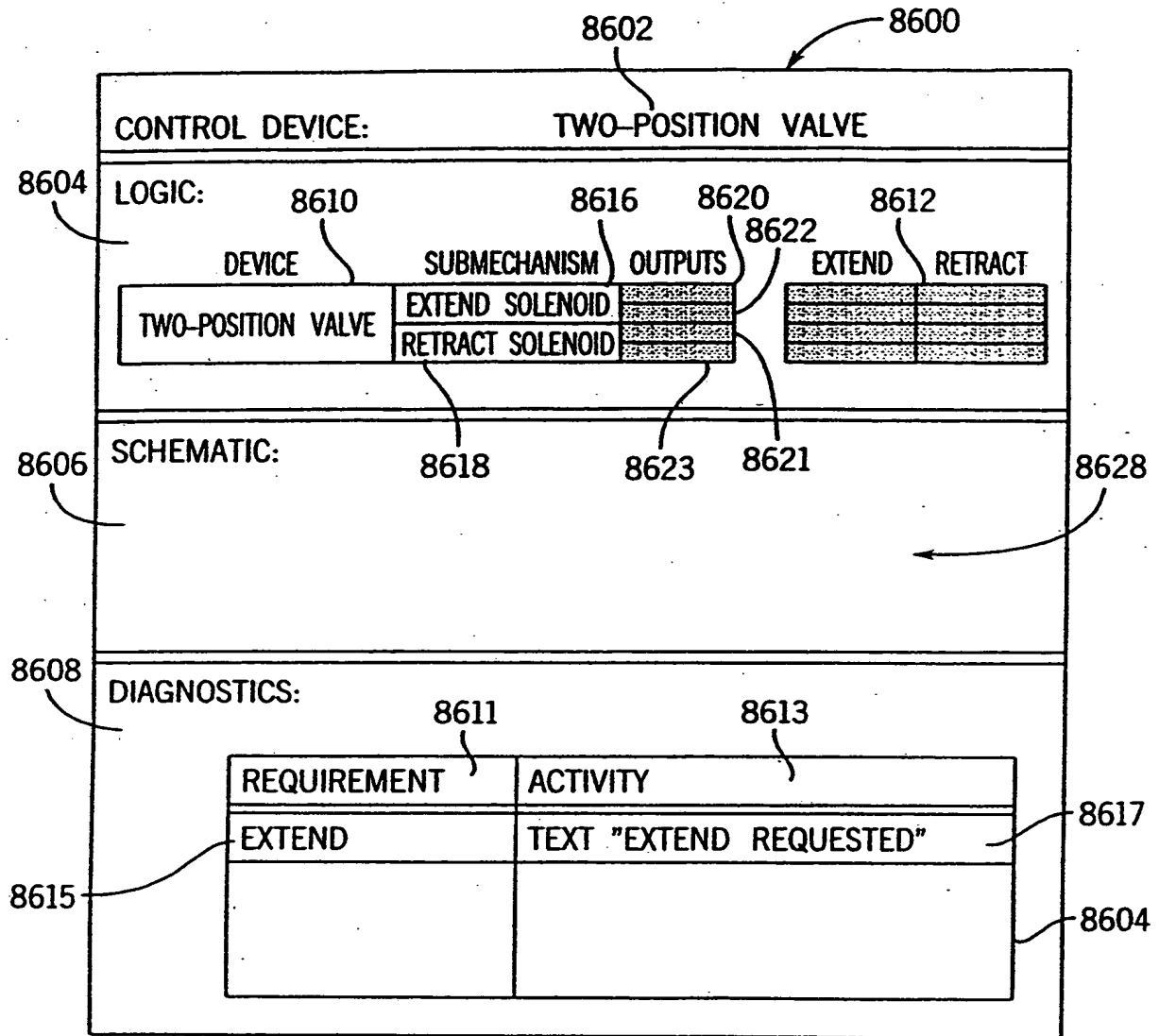


FIG. 82

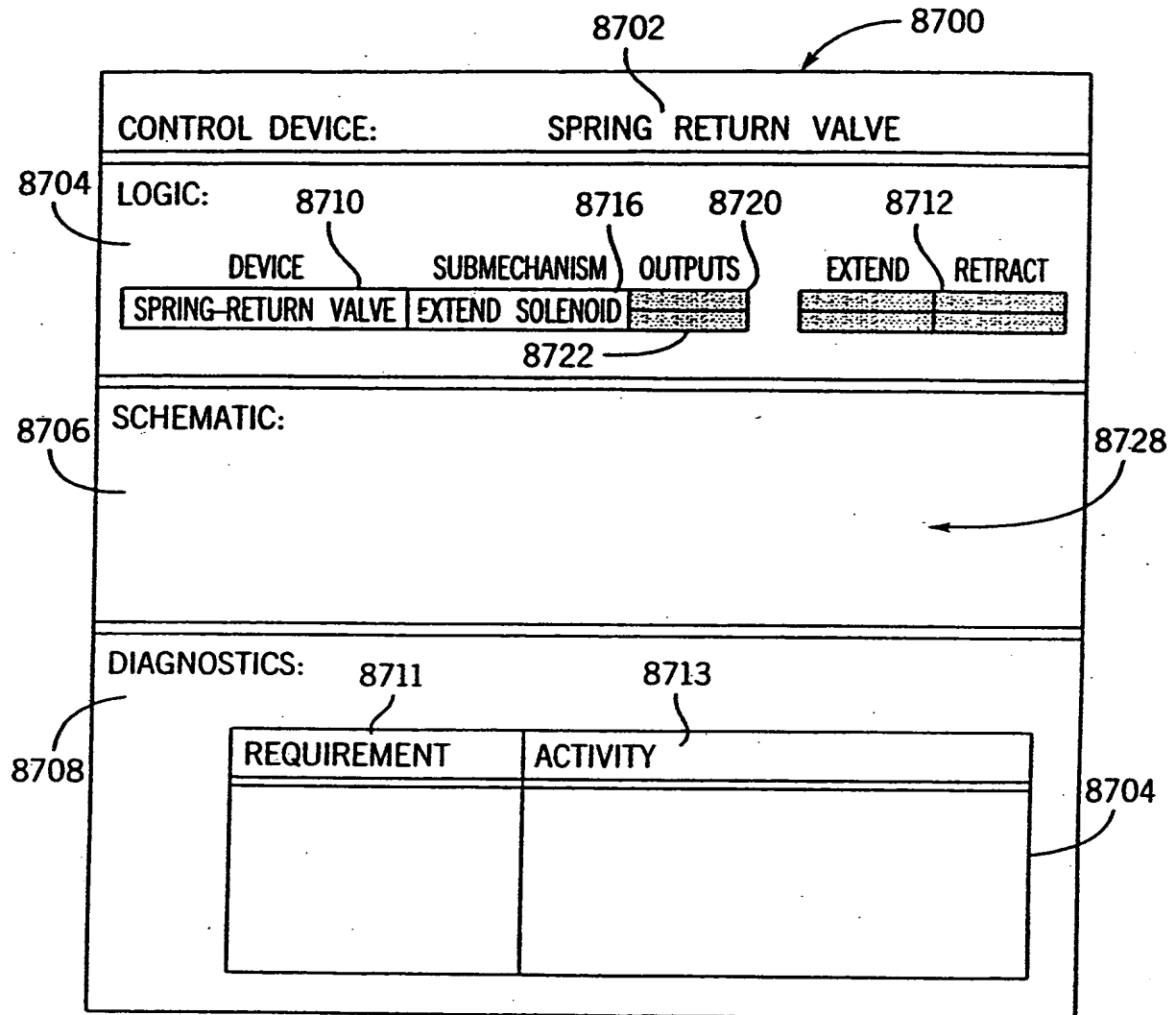


FIG. 83

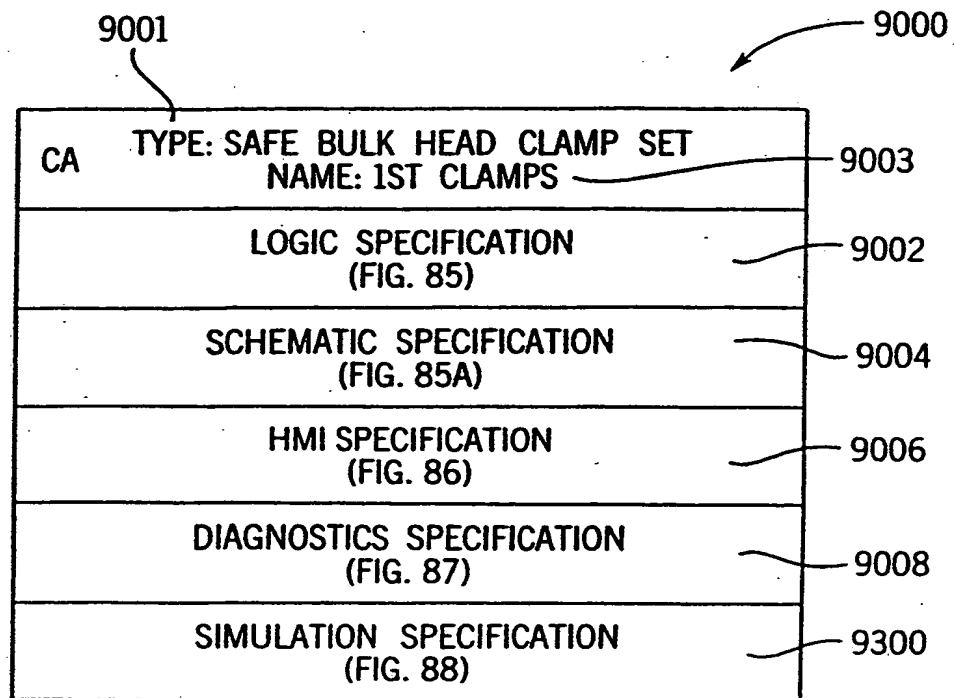


FIG. 84

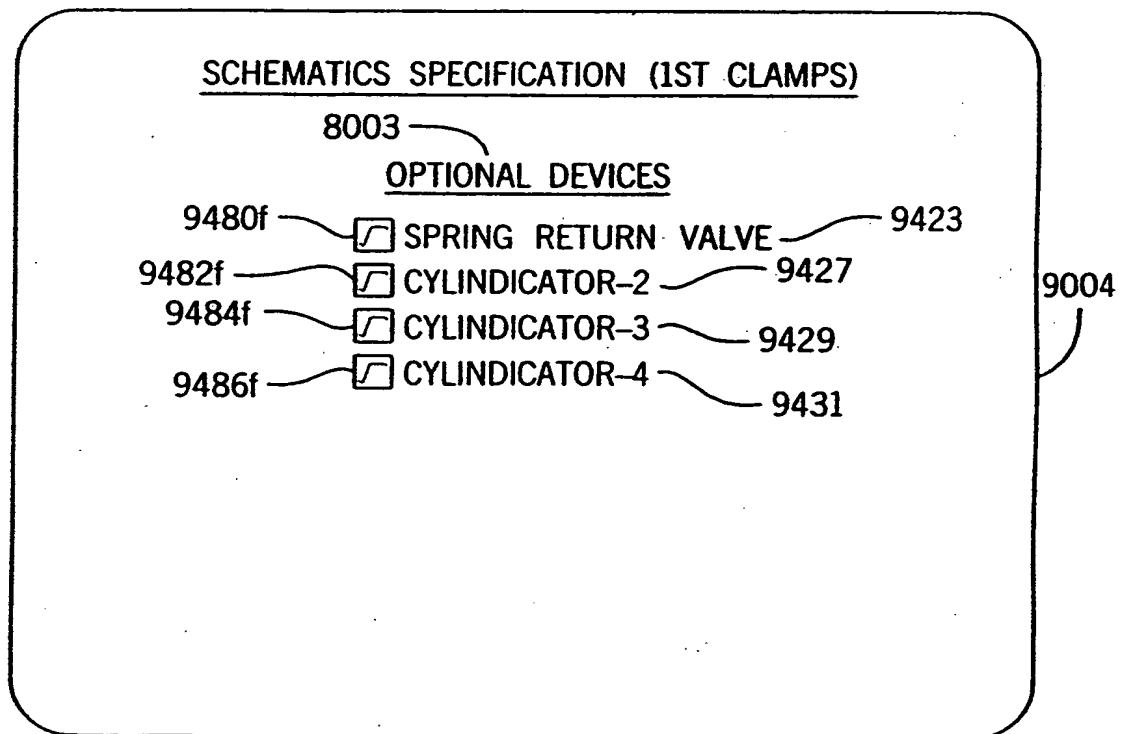


FIG. 85A

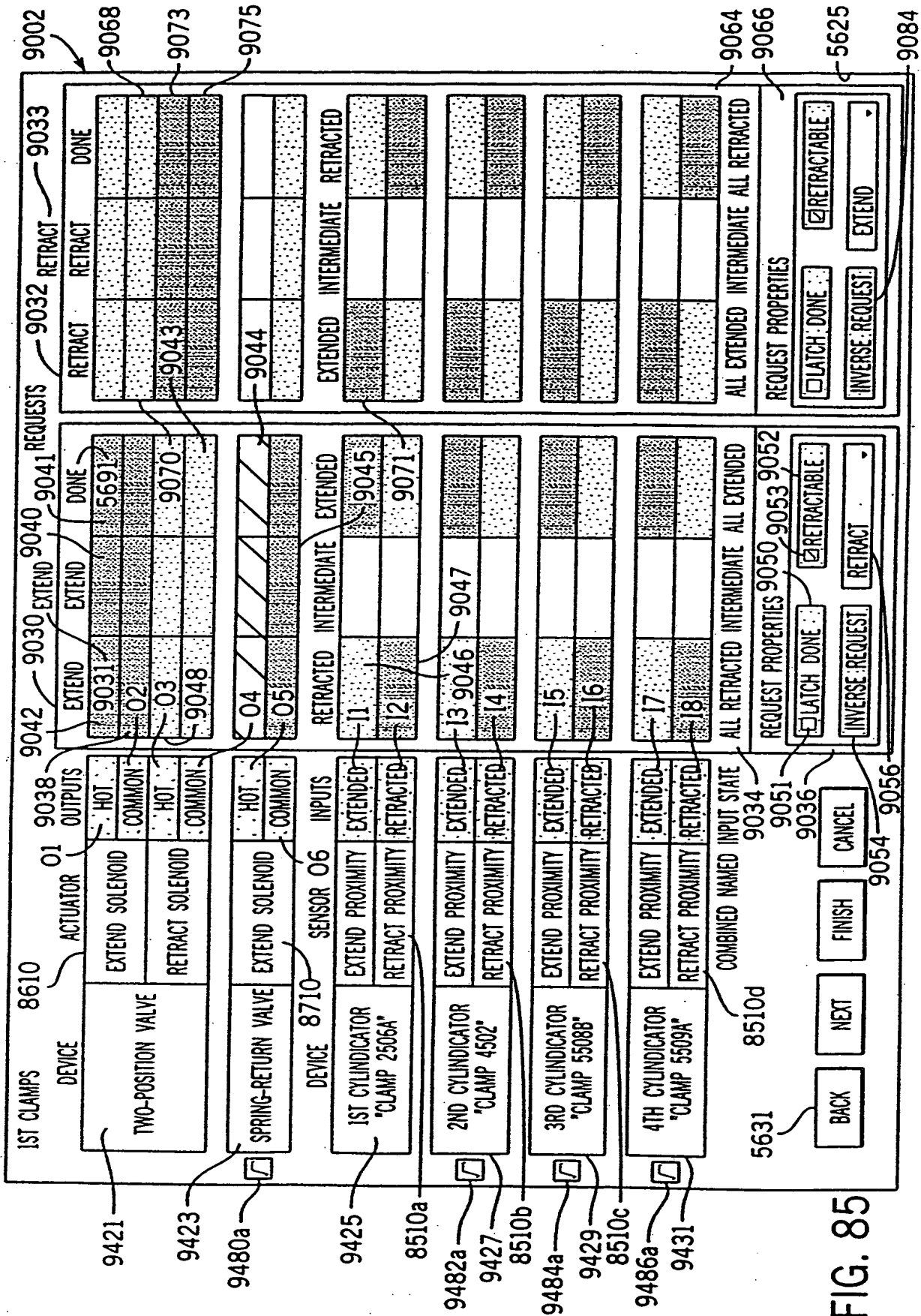


FIG. 85

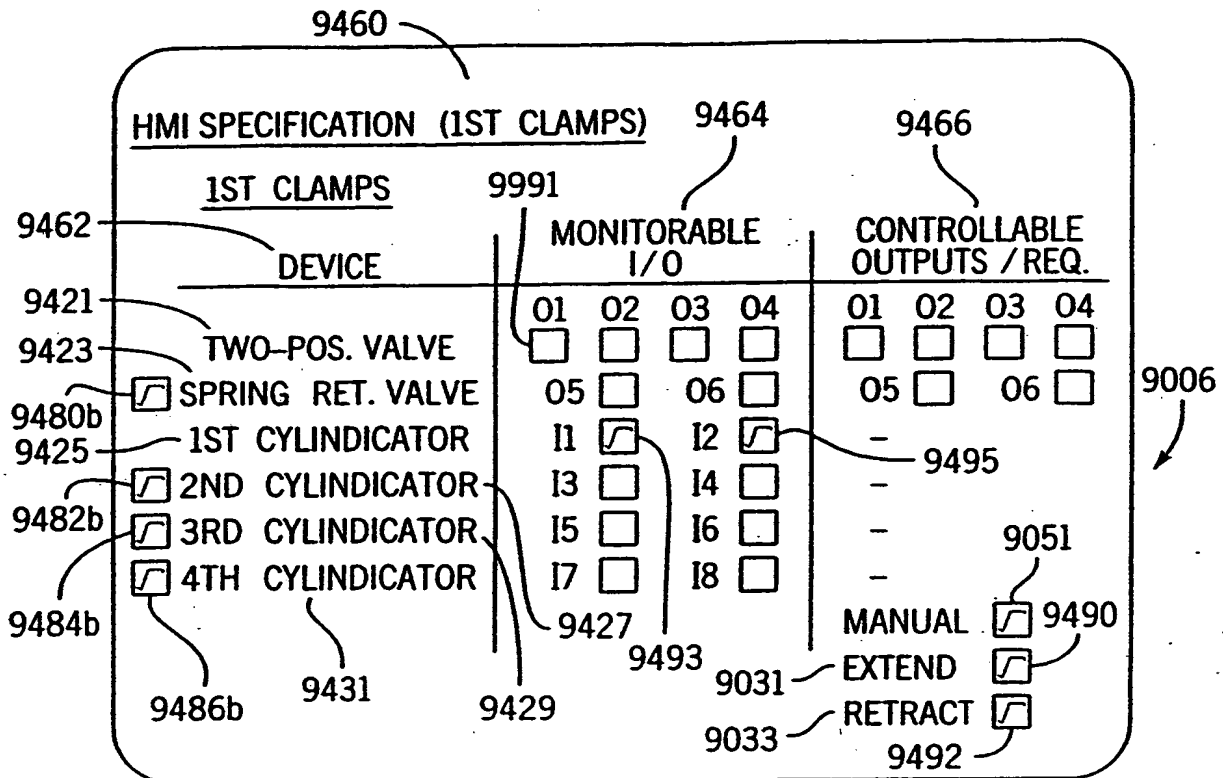


FIG. 86

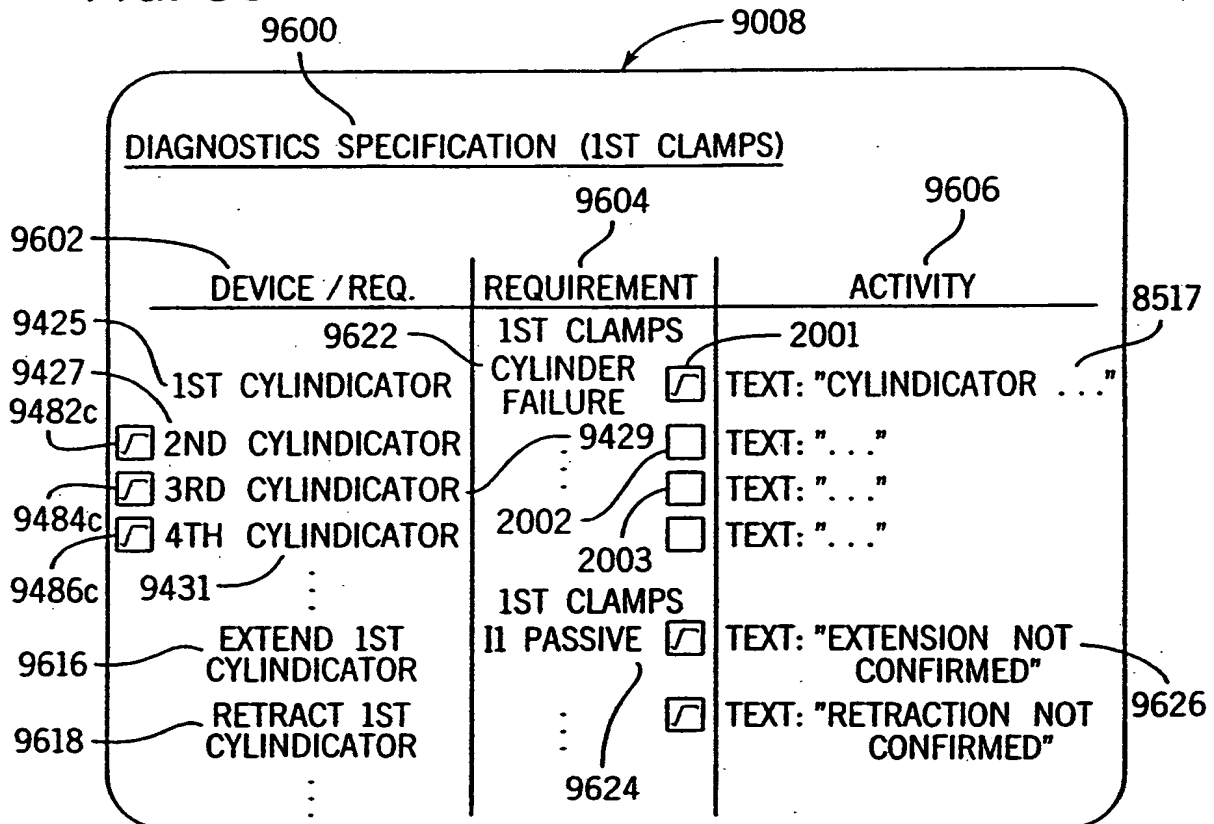


FIG. 87

STATUS BASED DIAGNOSTICS SPECIFICATION (1ST CLAMPS)																
REQUEST	REQUIREMENT										ACTIVITY	3523				
	01	02	03	04	05	06	11	12	13	14			15	16	17	18
3505	1	1	0	0	-	-	-	-	-	-	-	-	-	-	-	TEXT: "TWO-POSITION VALVE EXTEND"
3515	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	TEXT: "SPRING-RETURN VALVE EXTEND"
3511	EXTEND	-	-	-	-	-	1	0	-	-	-	-	-	-	-	TEXT: "1ST CYLINDICATOR EXTEND"
3517	3519	-	-	-	-	-	-	-	1	0	-	-	-	-	-	TEXT: "2ND CYLINDICATOR EXTEND"
9480g	3520	-	-	-	-	-	-	-	-	-	1	0	-	-	-	TEXT: "3RD CYLINDICATOR EXTEND"
9482g	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	TEXT: "4TH CYLINDICATOR EXTEND"
9484g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	TEXT: "TWO-POSITION VALVE RETRACT"
9486g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TEXT: "SPRING-RETURN VALVE RETRACT"
3513	RETRACT	0	1	1	-	-	-	-	-	-	-	-	-	-	-	TEXT: "1ST CYLINDICATOR RETRACT"
3521	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	TEXT: "2ND CYLINDICATOR RETRACT"
9480g	-	-	-	-	-	-	0	1	-	-	-	-	-	-	-	TEXT: "3RD CYLINDICATOR RETRACT"
9482g	-	-	-	-	-	-	-	-	0	1	-	-	-	-	-	TEXT: "4TH CYLINDICATOR RETRACT"
9484g	-	-	-	-	-	-	-	-	-	-	0	1	-	-	-	
9484g	-	-	-	-	-	-	-	-	-	-	-	-	0	1	-	

3501

3503

3504

9486g

FIG 87A

FIG. 87A

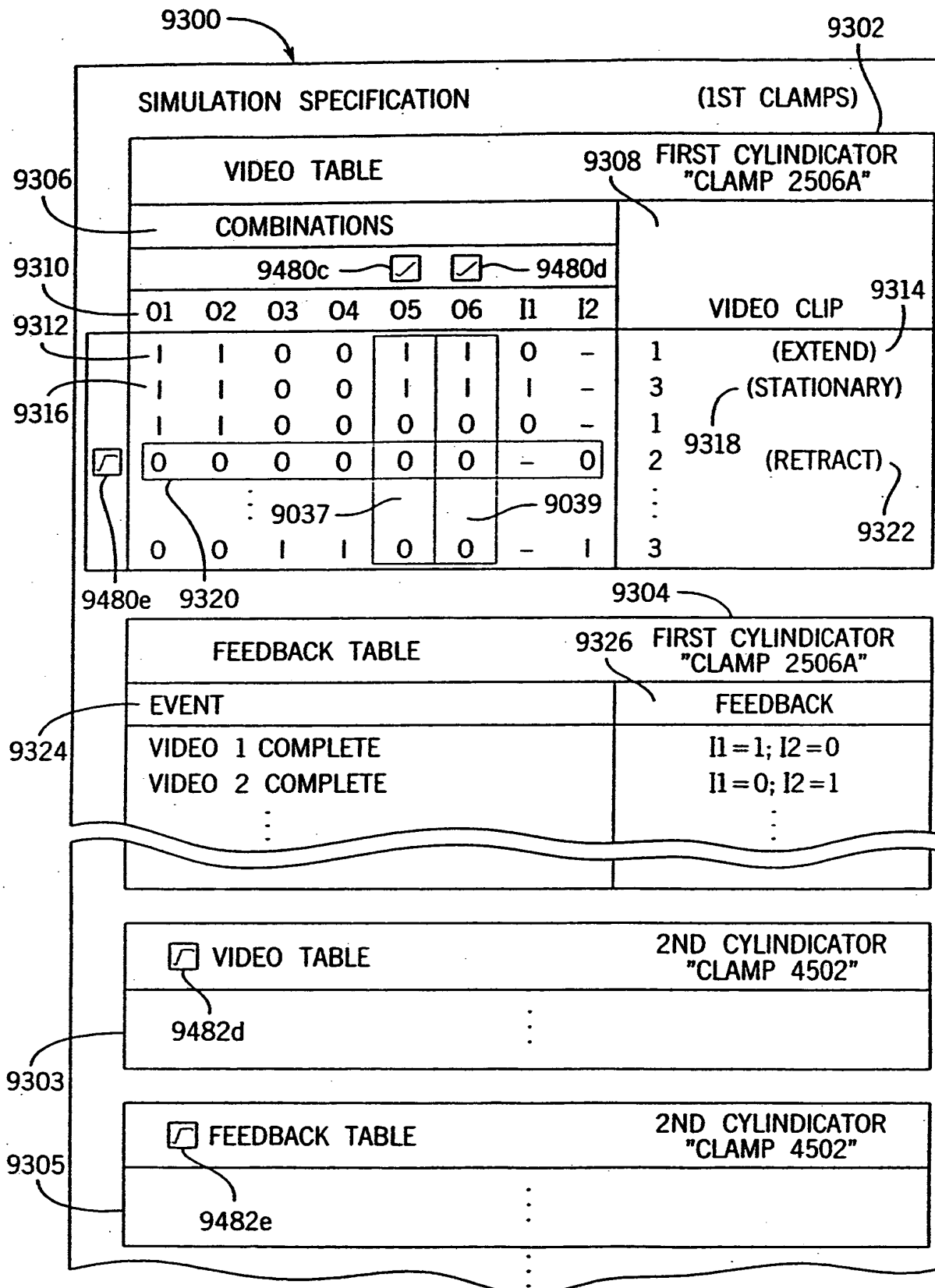


FIG. 88

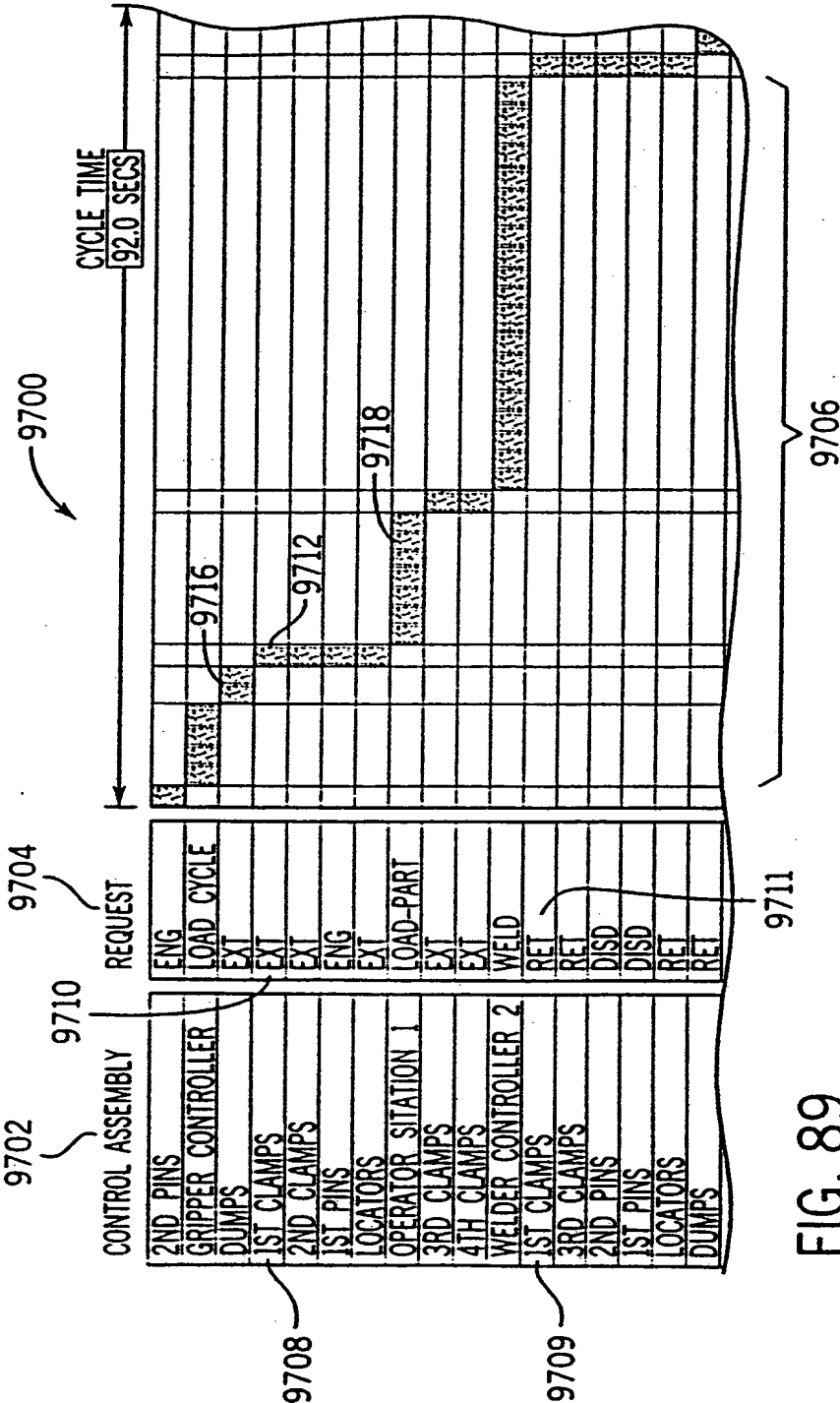


FIG. 89

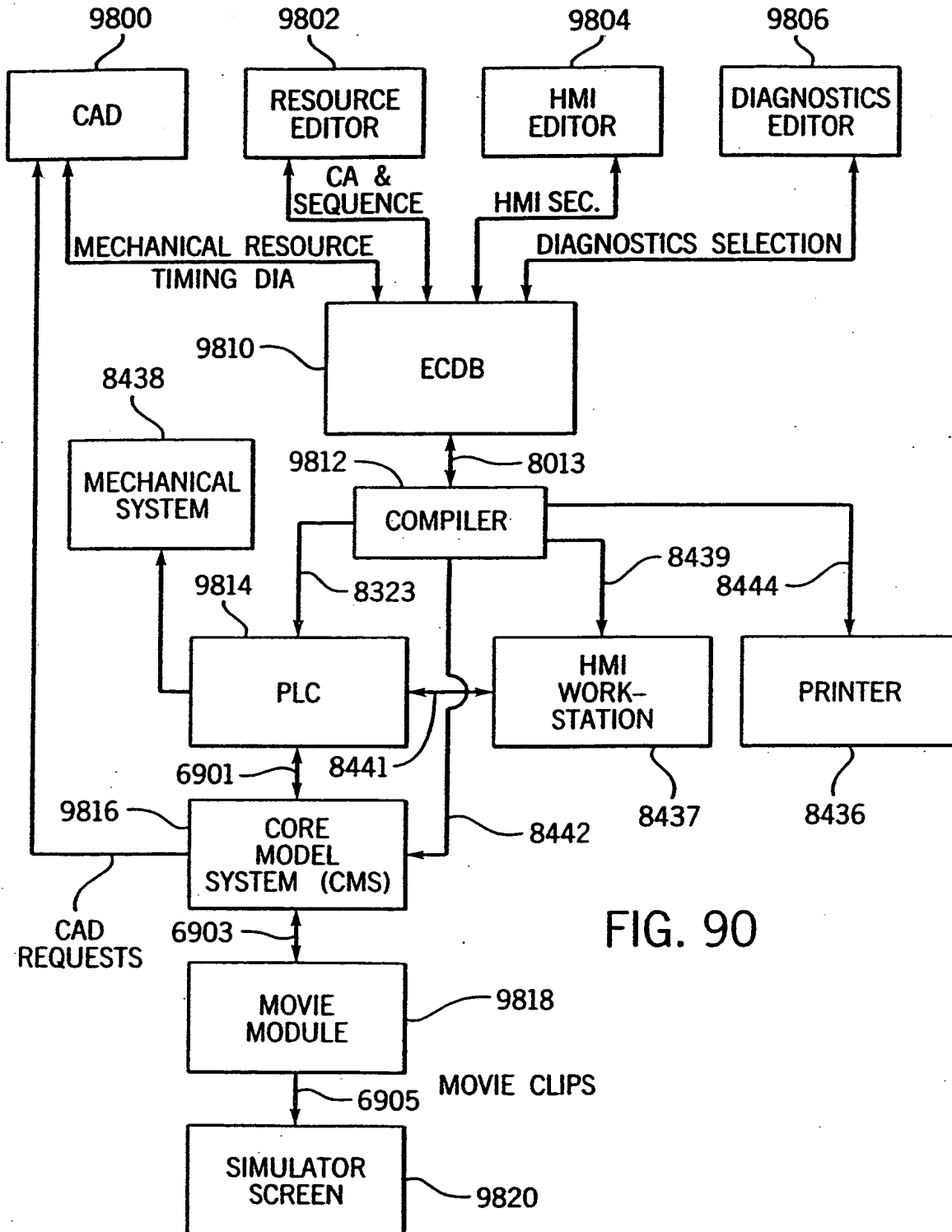
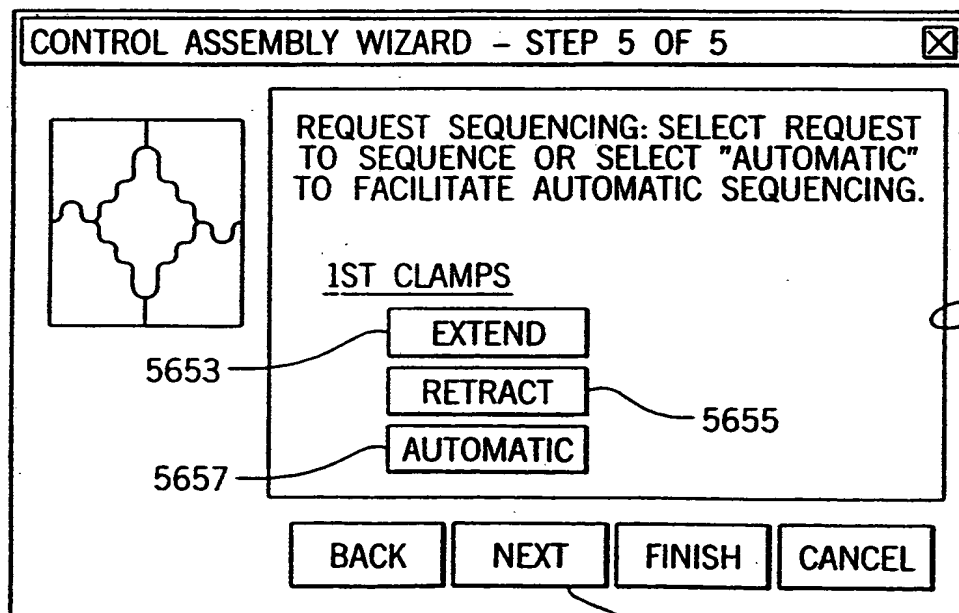
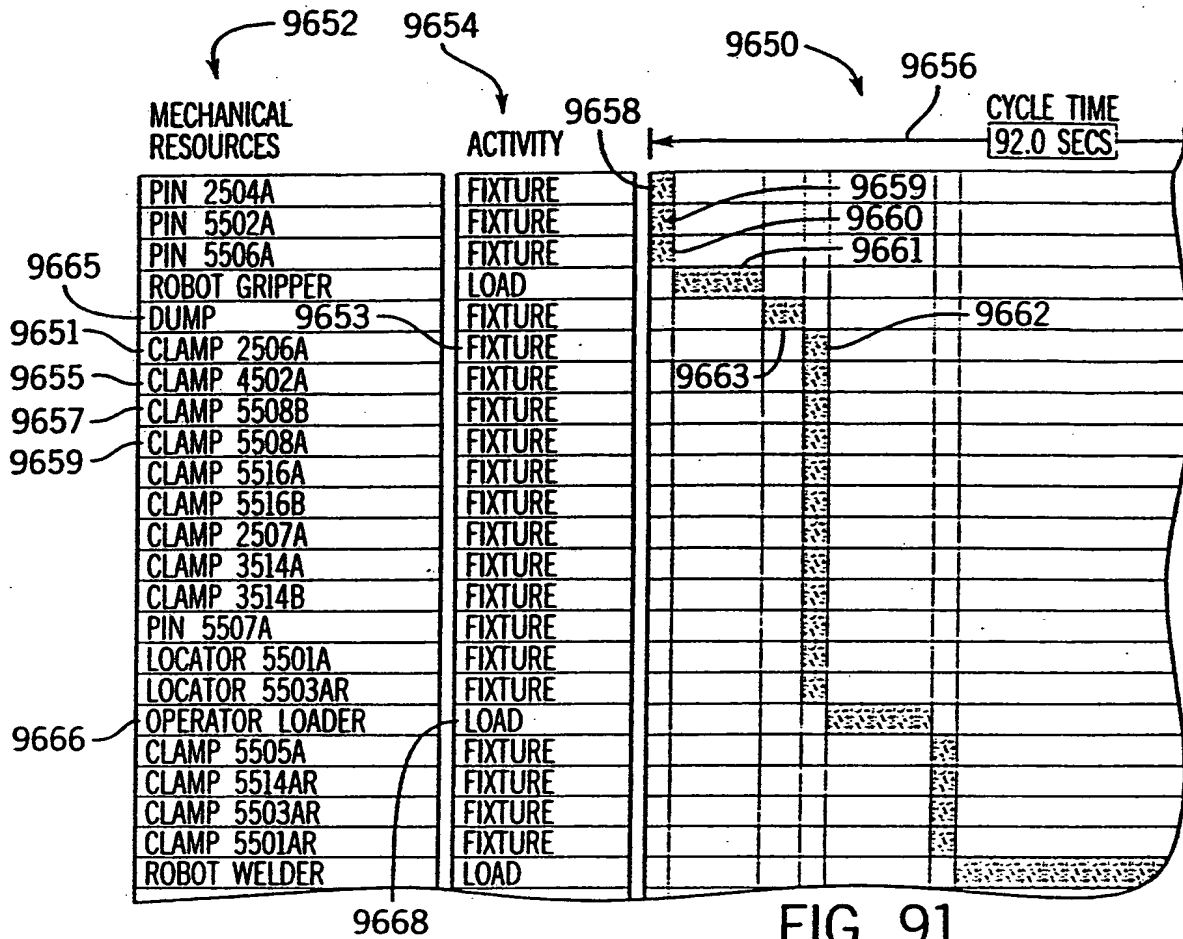


FIG. 90



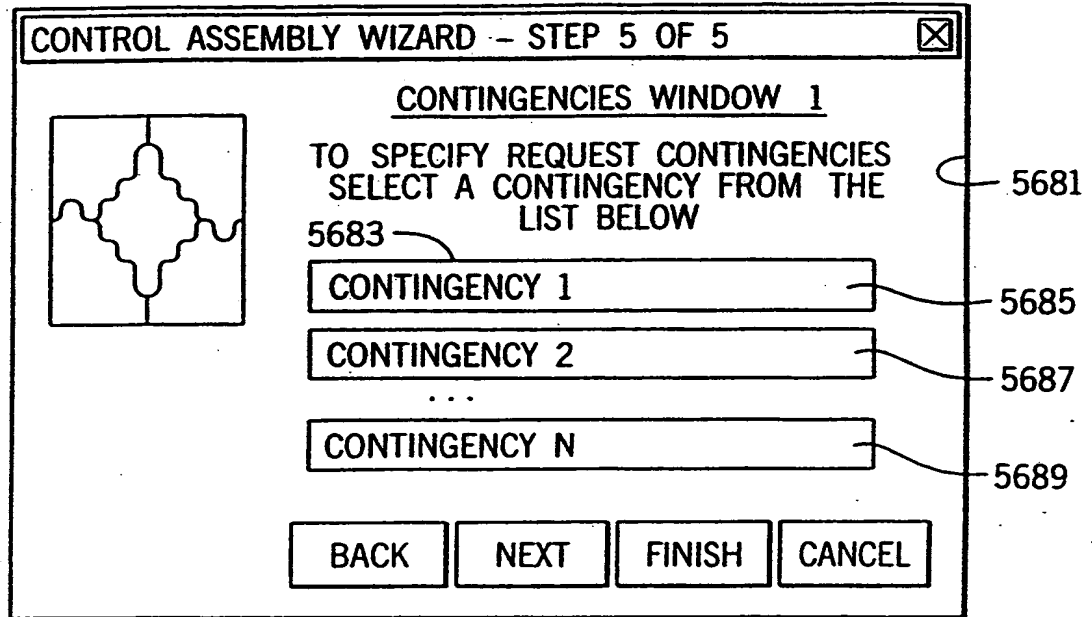


FIG. 93

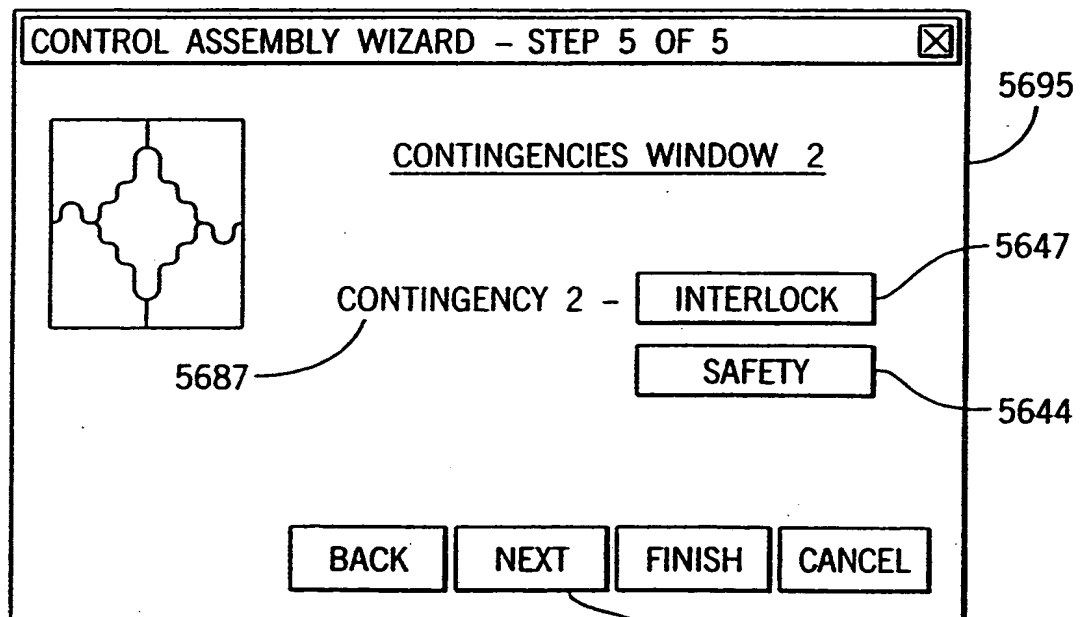


FIG. 94

5558

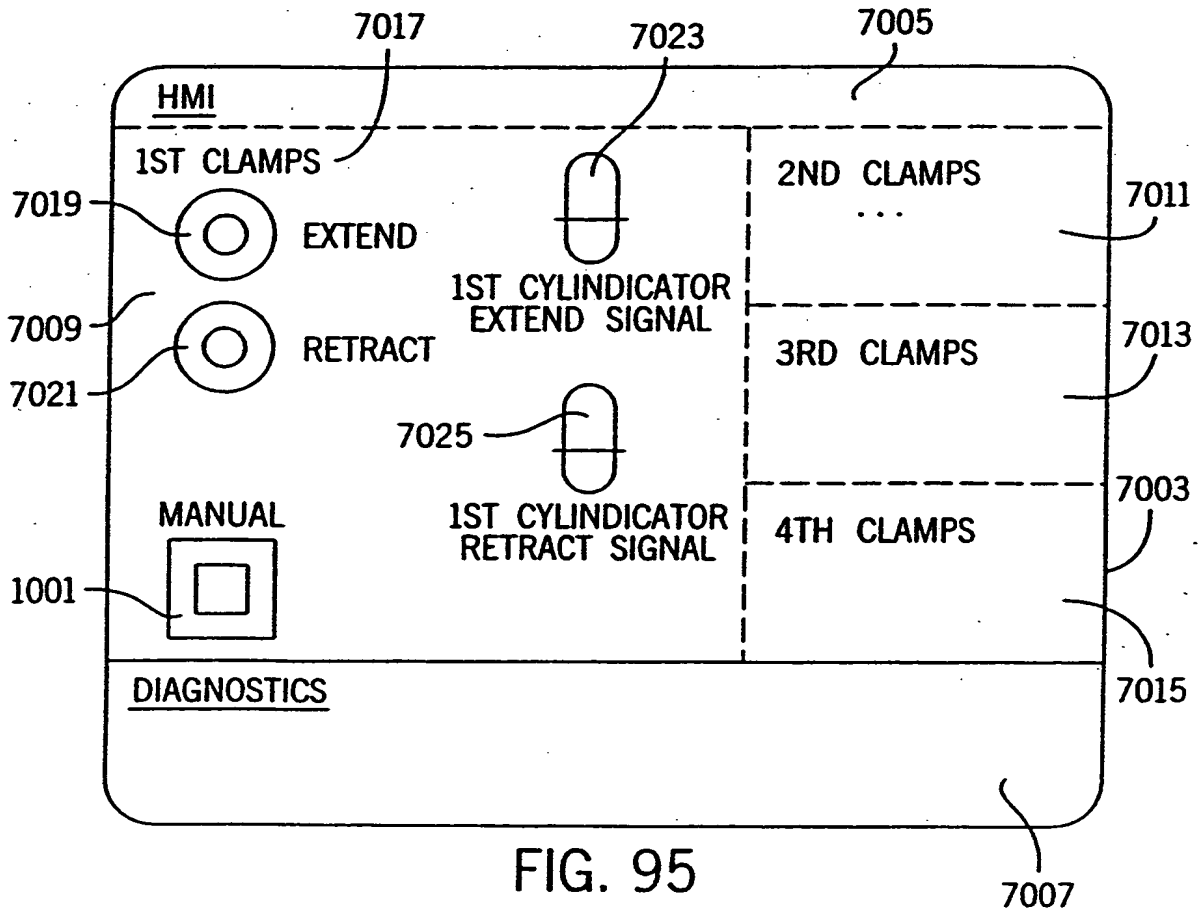


FIG. 95

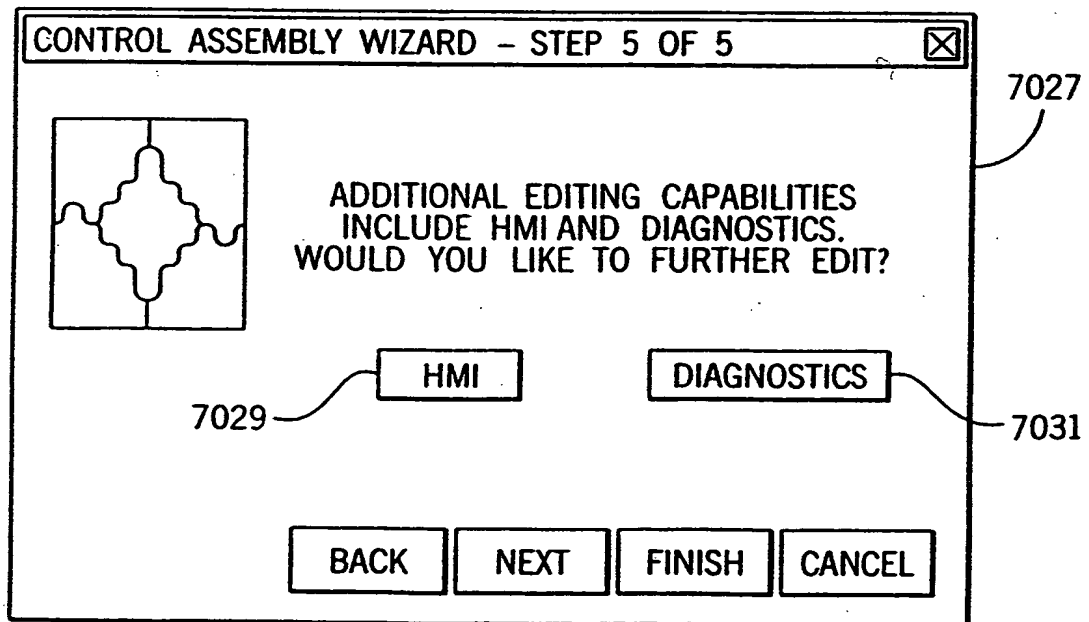


FIG. 96

HMI EDITOR:

SELECT A CA INSTANCE FROM THE LIST FOR HMI SPECIFICATION

7035

CONTROL ASSEMBLY INSTANCES

PAST - PRESENT

...

SAFE - BULKHEAD CLAMP SET 7039

1ST CLAMPS

2ND CLAMPS 7037

3RD CLAMPS

4TH CLAMPS

...

7033

BACK NEXT FINISH CANCEL

7061

FIG. 97

HMI EDITOR:

7043

1ST CLAMPS

7049	7045 MONITORABLE I/O				7047 CONTROLLABLE I/O / REQ.			
	01	02	03	04	01	02	03	04
9421 TWO-POS. VALVE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9423 SPRING RET VALVE	05	<input type="checkbox"/>	06	<input type="checkbox"/>	05	<input type="checkbox"/>	06	<input type="checkbox"/>
9425 CYLINDICATOR-1	11	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	-	7051	-	7055
9427 CYLINDICATOR-2	13	<input type="checkbox"/>	14	<input type="checkbox"/>	-	7055	-	7051
9429 CYLINDICATOR-3	15	<input type="checkbox"/>	16	<input type="checkbox"/>	-	-	-	-
9431 CYLINDICATOR-4	17	<input type="checkbox"/>	18	<input type="checkbox"/>	-	-	-	-

7053

EXTEND ☒ 7057

RETRACT ☒ 7059

BACK NEXT FINISH CANCEL

7041

7601

FIG. 98

DIAGNOSTICS EDITOR: **SELECT A CA INSTANCE FROM THE LIST FOR DIAGNOSTICS SPECIFICATION**

7103
CONTROL ASSEMBLY INSTANCES

PAST - PRESENT
⋮

SAFE - BULKHEAD CLAMP SET 7107
1ST CLAMPS
2ND CLAMPS 7105
3RD CLAMPS
4TH CLAMPS

7101

7601

FIG. 99

DIAGNOSTICS EDITOR:

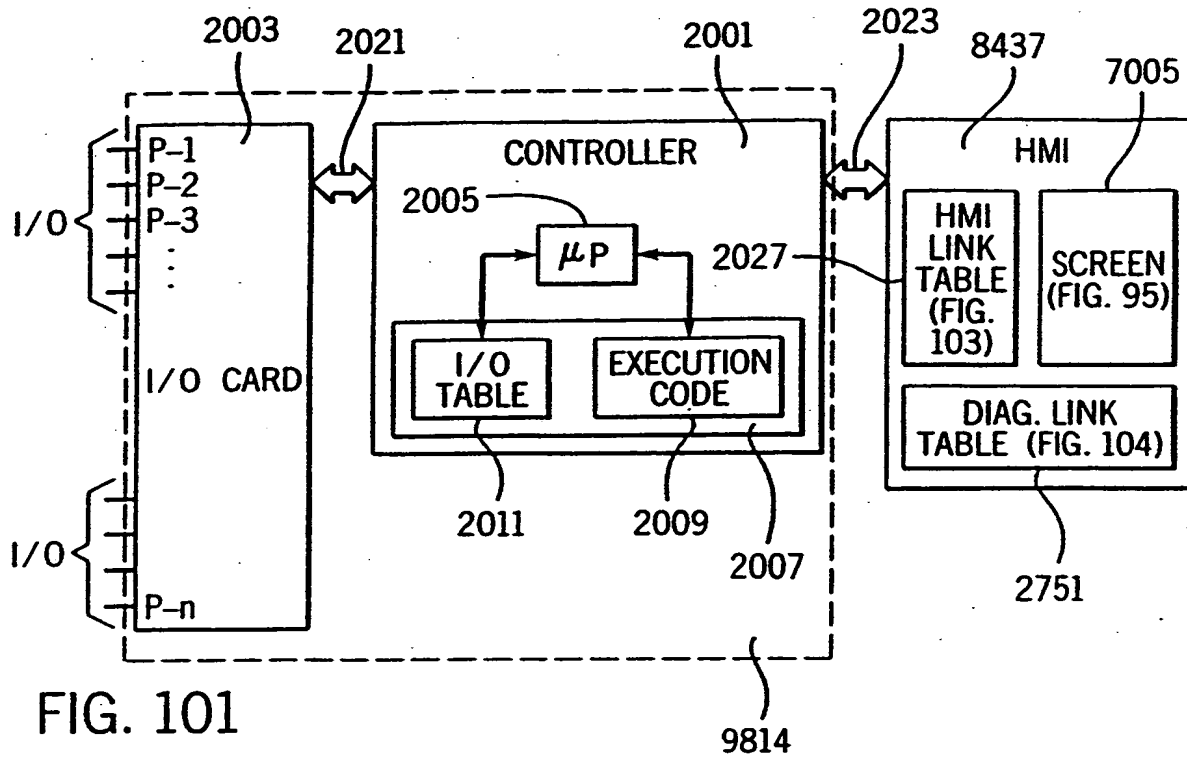
7111 7113 7117 7115

1ST CLAMPS	REQUIREMENT	ACTIVITY
CYLINDICATOR-1	FAILURE <input checked="" type="checkbox"/>	TEXT: "CYLINDICATOR ..."
CYLINDICATOR-2	FAILURE <input type="checkbox"/>	TEXT: "..."
CYLINDICATOR-3	FAILURE <input type="checkbox"/>	TEXT: "..."
CYLINDICATOR-4	FAILURE <input type="checkbox"/>	TEXT: "..."
EXTEND 1ST CYLINDICATOR	I1 PASSIVE <input checked="" type="checkbox"/>	TEXT: "SENSOR ERROR"
RETRACT 1ST CYLINDICATOR	I2 PASSIVE <input checked="" type="checkbox"/>	TEXT: "SENSOR ERROR"

7109

7601

FIG. 100



HMI LINKING TABLE			
CA INSTANCE	LABEL	TYPE	I/O
1ST CLAMPS	1ST CYLINDRICATOR EXTEND SIGNAL	INDIC.	1ST CLAMPS I1
	1ST CYLINDRICATOR RETRACT SIGNAL	INDIC.	1ST CLAMPS I2
MANUAL		BUT.	MANUAL
EXTEND		BUT.	1ST CLAMPS EXTEND REQUEST CONTROL
RETRACT		BUT.	1ST CLAMPS RETRACT REQUEST CONTROL
2ND CLAMPS			
...

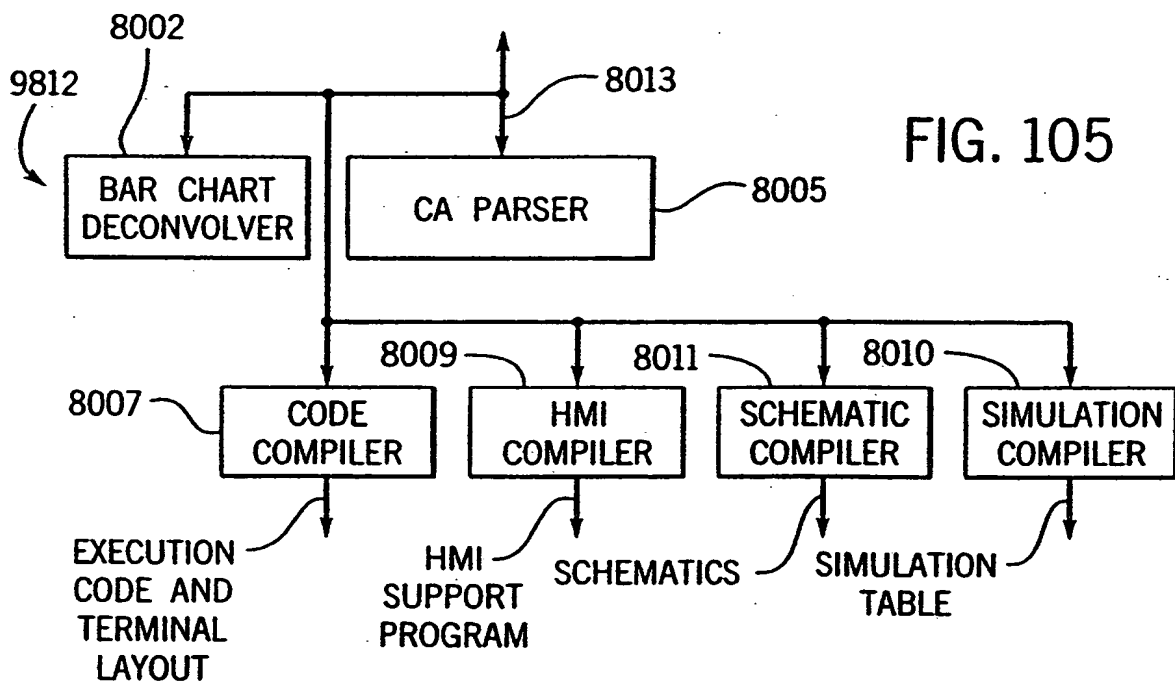
FIG. 103

2019	8037	2015	2017
PIN #	SIGNAL	STATUS	
8034	P-1	1ST CLAMPS 01	1
	P-2	1ST CLAMPS 02	1
	⋮	⋮	⋮
8043		1ST CLAMPS 06	0
8046	P-X	1ST CLAMPS 11	0
2723	⋮	1ST CLAMPS 12	⋮
8049		⋮	⋮
2137		1ST CLAMPS 18	1
2729		1ST CLAMPS EXTEND REQUEST	0
2049		1ST CLAMPS SAFETY OVERRIDE	1
2051		1ST CLAMPS SAFETY 1	0
		1ST CLAMPS SAFETY 2	⋮
2077		1ST CLAMPS INTERLOCK 1	⋮
2079		1ST CLAMPS INTERLOCK 2	⋮
		⋮	⋮
		1ST CLAMPS EXTEND SENSOR ERROR	8113
		1ST CLAMPS CYLINDER FAILURE	8048
		⋮	⋮
2131		1ST CLAMPS EXTEND DONE MANUAL	2727
2133		1ST CLAMPS 01 CONTROL	⋮
2725	P-Y	1ST CLAMPS 06 CONTROL	⋮
2135		1ST CLAMPS EXTEND REQUEST CONTROL	⋮
2136		1ST CLAMPS RETRACT REQUEST CONTROL	⋮
	⋮	⋮	⋮

FIG. 102

2753 DIAGNOSTICS LINKING TABLE		2755
LINK TO	ACTIVITY	2759
8113 1ST CLAMPS EXTEND SENSOR ERROR	TEXT: "CYLINDICATOR SENSOR FAILURE"	2751
8048 1ST CLAMPS CYLINDER FAILURE	TEXT: "EXTENSION NOT CONFIRMED"	2761
⋮	⋮	

FIG. 104



8021

CODE BUILDING TABLE																		
8023 CA TYPE / REQUEST	8025 CODE SEGMENT	8026 CODE I/O	8027 PARAMETERIZING RULE SET (PRS)															
PART-PRESENT 8201 8207															
NACHISA160-CONT.	8203 ... 8205 8221															
SAFE BULK HEAD CLAMPS -EXTEND 8029 8033	<div style="border: 1px solid black; padding: 2px; text-align: center;">CODE</div> <div style="margin-top: 10px;">8032</div> <div style="margin-top: 10px;">8060</div> <div style="margin-top: 10px;">2731</div>	<div style="border: 1px solid black; padding: 2px; text-align: center;">PLC I/O TABLE SEGM.</div> <div style="margin-top: 10px;">8209</div>	<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 33%; text-align: left; padding: 2px;">PARAMETER</th><th style="width: 33%; text-align: left; padding: 2px;">CODE MODIFICATION</th><th style="width: 33%; text-align: left; padding: 2px;">PLC I/O TABLE MODIFICATIONS</th></tr></thead><tbody><tr><td style="padding: 2px;">FLAGGED BOX 9480a</td><td style="padding: 2px;">CLOSE SWITCHES S3 AND S4</td><td style="padding: 2px;">ADD 05; 06</td></tr><tr><td style="padding: 2px;">FLAGGED BOX 9490</td><td style="padding: 2px;">CLOSE SWITCH S-14</td><td style="padding: 2px;">ADD 1ST CLAMPS EXTEND REQUEST CONTROL</td></tr><tr><td style="text-align: center; padding: 2px;">⋮</td><td style="padding: 2px;">8215 : 8217</td><td style="text-align: center; padding: 2px;">⋮</td></tr><tr><td colspan="3" style="text-align: right; padding: 2px;">8301</td></tr></tbody></table>	PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS	FLAGGED BOX 9480a	CLOSE SWITCHES S3 AND S4	ADD 05; 06	FLAGGED BOX 9490	CLOSE SWITCH S-14	ADD 1ST CLAMPS EXTEND REQUEST CONTROL	⋮	8215 : 8217	⋮	8301		
PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS																
FLAGGED BOX 9480a	CLOSE SWITCHES S3 AND S4	ADD 05; 06																
FLAGGED BOX 9490	CLOSE SWITCH S-14	ADD 1ST CLAMPS EXTEND REQUEST CONTROL																
⋮	8215 : 8217	⋮																
8301																		
8035 -RETRACT	<div style="border: 1px solid black; padding: 2px; text-align: center;">CODE</div> <div style="margin-top: 10px;">8034</div>		<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 33%; text-align: left; padding: 2px;">PARAMETER</th><th style="width: 33%; text-align: left; padding: 2px;">CODE MODIFICATION</th><th style="width: 33%; text-align: left; padding: 2px;">PLC I/O TABLE MODIFICATIONS</th></tr></thead><tbody><tr><td colspan="3" style="height: 30px;"></td></tr></tbody></table>	PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS												
PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS																
8038 -MANUAL 8012	<div style="border: 1px solid black; padding: 2px; text-align: center;">CODE</div>		<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 33%; text-align: left; padding: 2px;">PARAMETER</th><th style="width: 33%; text-align: left; padding: 2px;">CODE MODIFICATION</th><th style="width: 33%; text-align: left; padding: 2px;">PLC I/O TABLE MODIFICATIONS</th></tr></thead><tbody><tr><td colspan="3" style="height: 30px;"></td></tr></tbody></table>	PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS												
PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS																
PINSET 8303															
LOCATOR SET	...																	
⋮	⋮		⋮															

FIG. 106

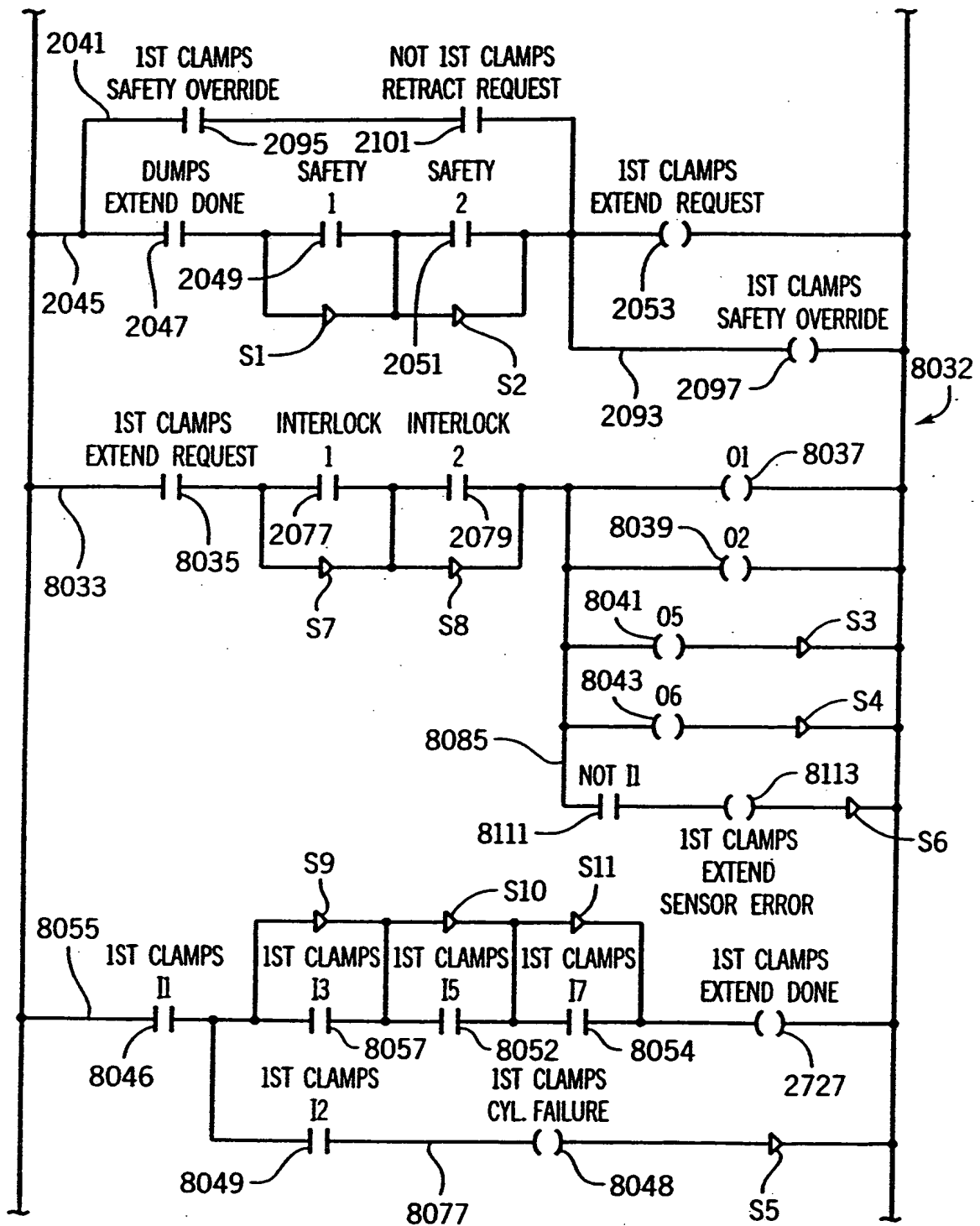


FIG. 107

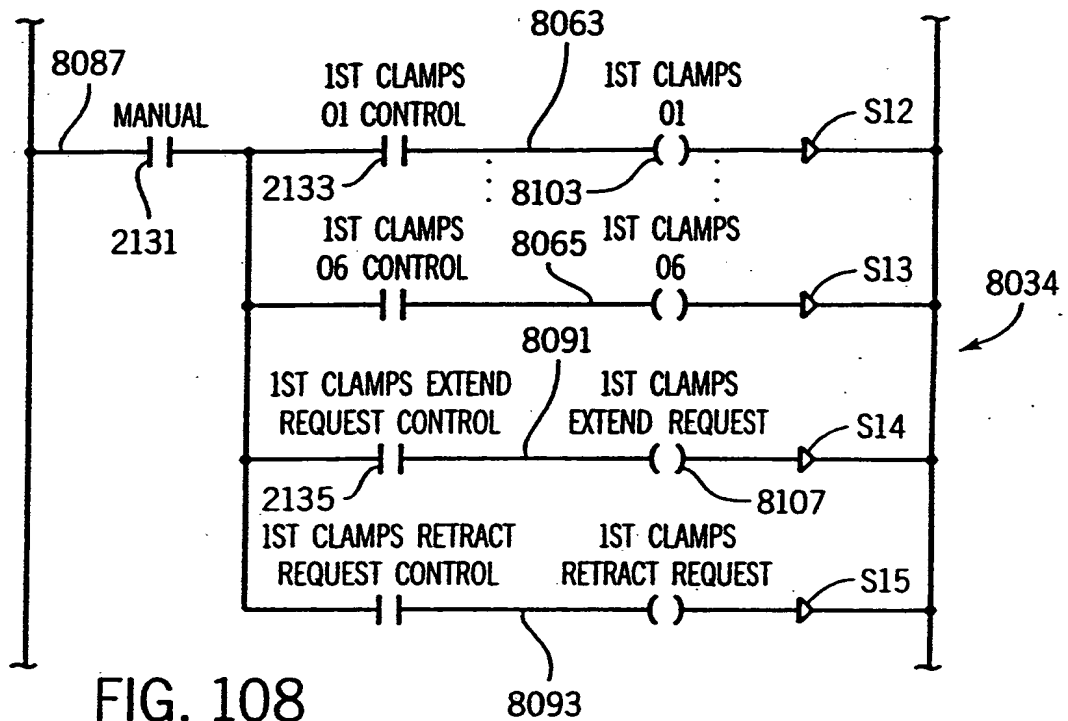


FIG. 108

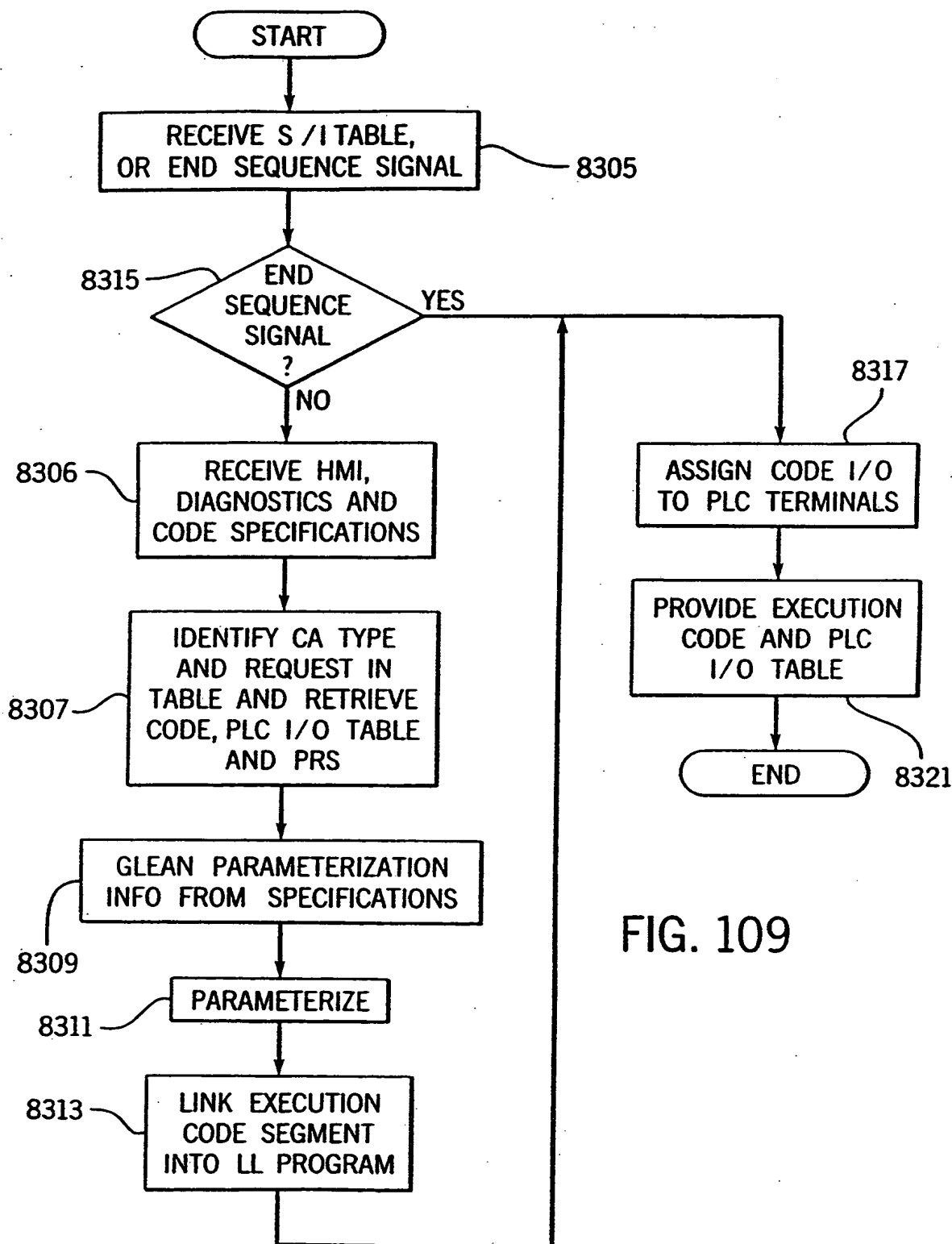


FIG. 109

8401

HMI BUILDING TABLE						
CA TYPE	I/O	LABEL	LINK TO	I/O REQ	LABEL	LINK TO
PART-PRESENT	...	...		...	...
NACHISA 160-CONT.	...	...		...	...
SAFE BULKHEAD CLAMP SET 8029	01	2-POSITION VALVE HOT EXTEND OUTPUT	"NAME" 01	01	2-POSITION VALVE HOT EXTEND	"NAME" 01 CONTROL
	02	2-POSITION VALVE COMMON EXTEND OUTPUT	"NAME" 02	02	2-POSITION VALVE COMMON EXTEND	"NAME" 02 CONTROL

	11	1ST CYLINDRATOR EXTEND SIGNAL	"NAME" 11	EXTEND	EXTEND	"NAME" EXTEND REQUEST CONTROL
	12	1ST CYLINDRATOR RETRACT SIGNAL	"NAME" 12	RETRACT	RETRACT	"NAME" RETRACT REQUEST CONTROL
PIN-SET	...	...		...	...
	

FIG. 110

8741

8745

8739

9622

9624

9626

8517

8743

DIAGNOSTICS BUILDING TABLE

REQUIREMENT	TEXT	LINK TO
1ST CLAMPS CYLINDER FAILURE ⋮	"CYLINDICATOR SENSOR FAILURE"	
1ST CLAMPS II PASSIVE	"EXTENSION NOT CONFIRMED"	

FIG. 111

2899

2907

2903

2905

2901

8029

2909

2911

2913

SIMULATION BUILDING TABLE

CA TYPE	PARAMETERIZATION	MODIFICATION
SAFE BULKHEAD CLAMPSET	CLEAR BOX 9482d	DELETE TABLE 9303
	CLEAR BOX 9480e	DELETE COMBINATION 9320
	⋮	⋮
PINSET	⋮	⋮

FIG. 115

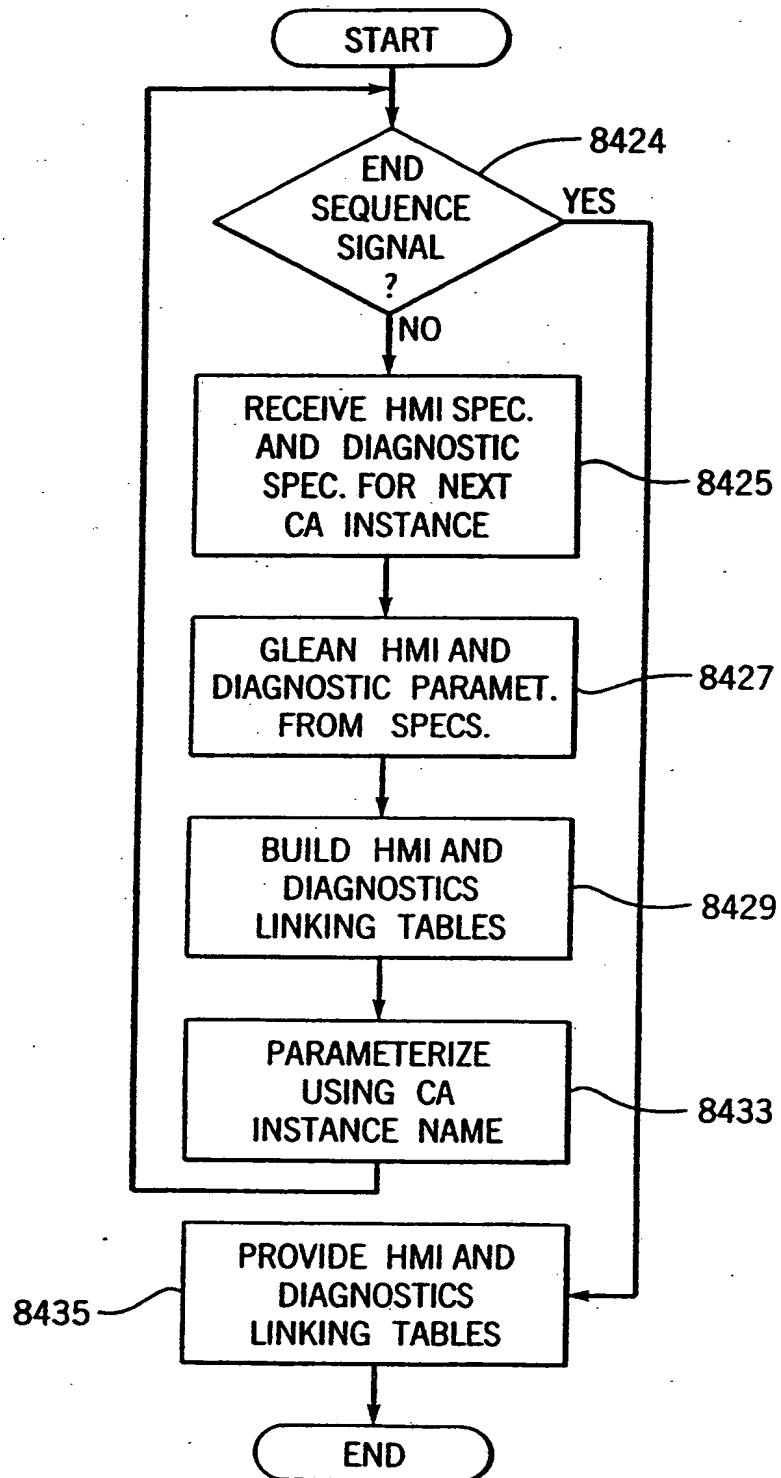


FIG. 112

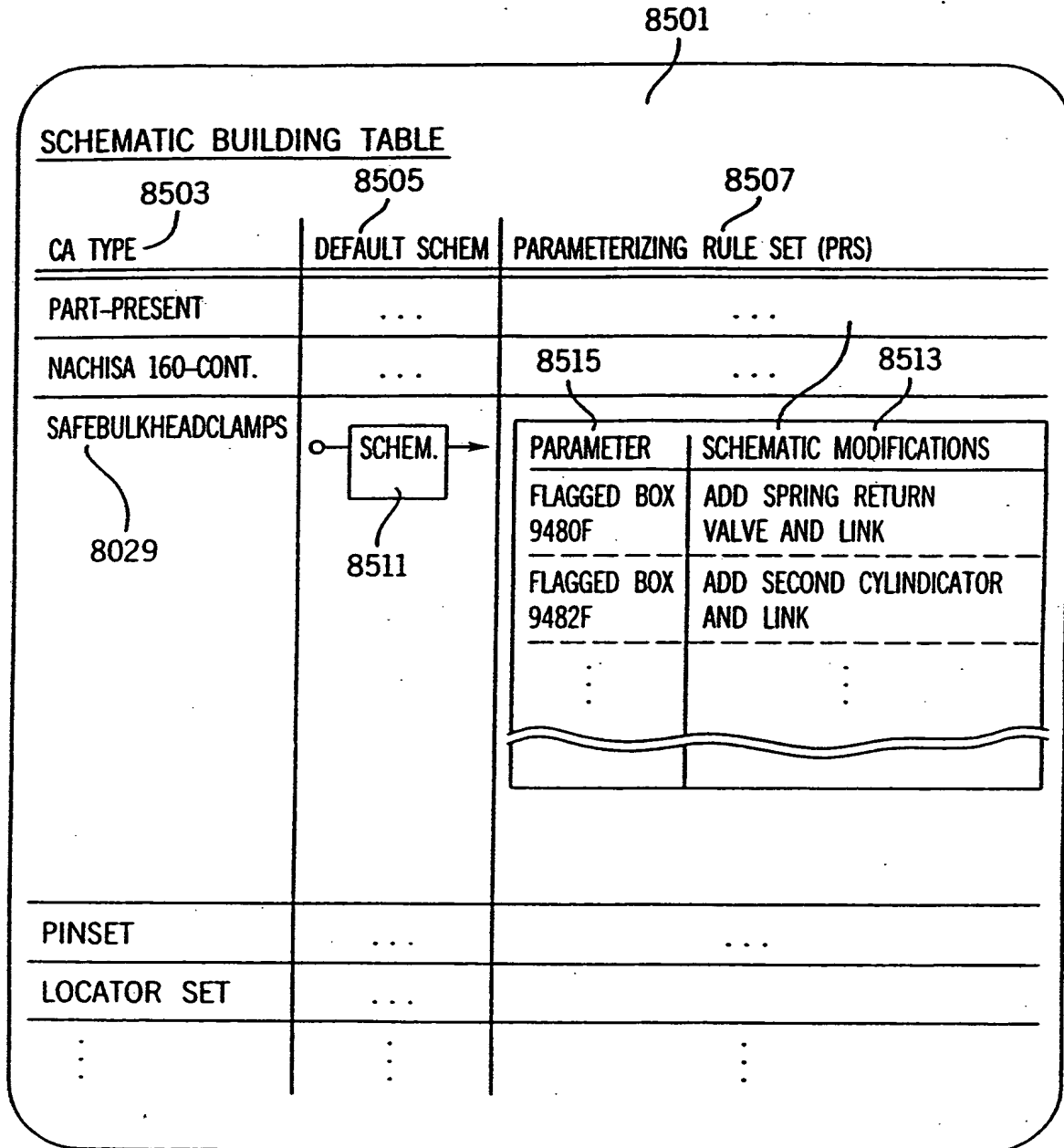
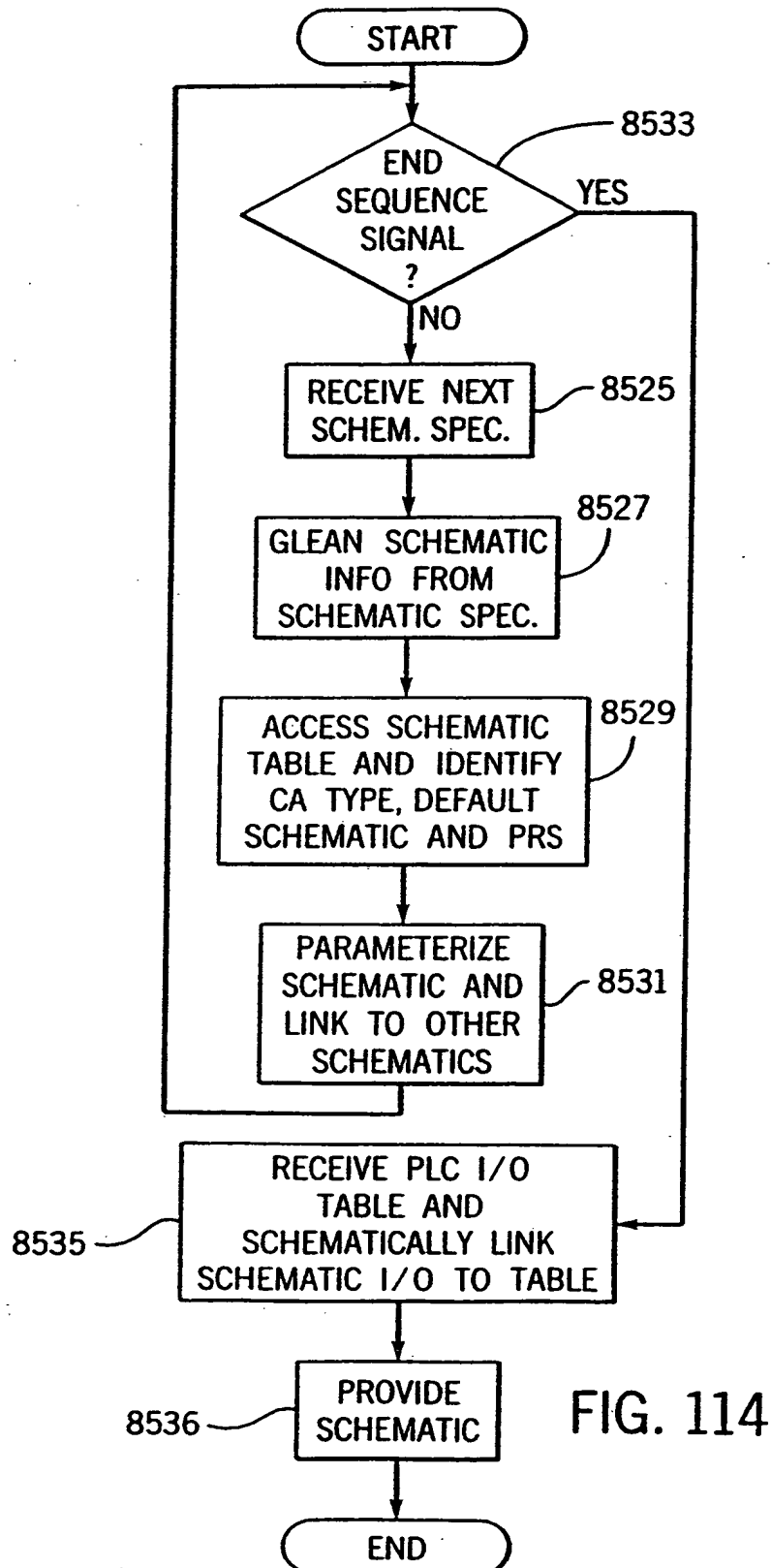


FIG. 113



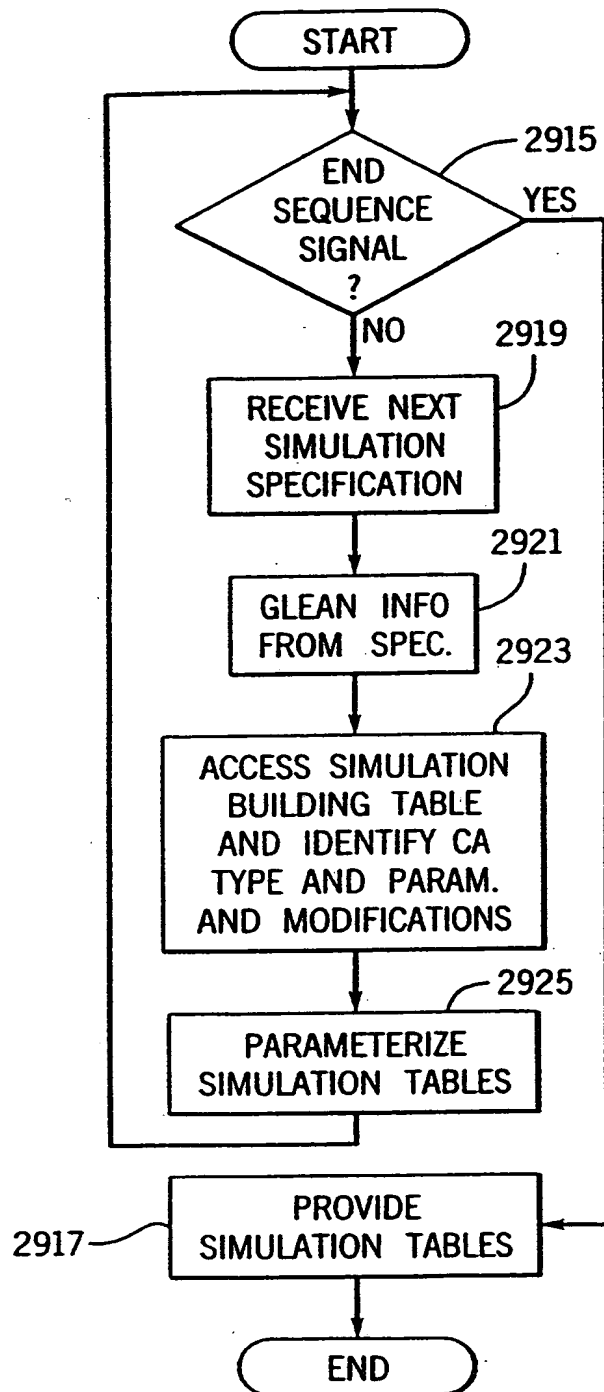


FIG. 116

FIG. 117

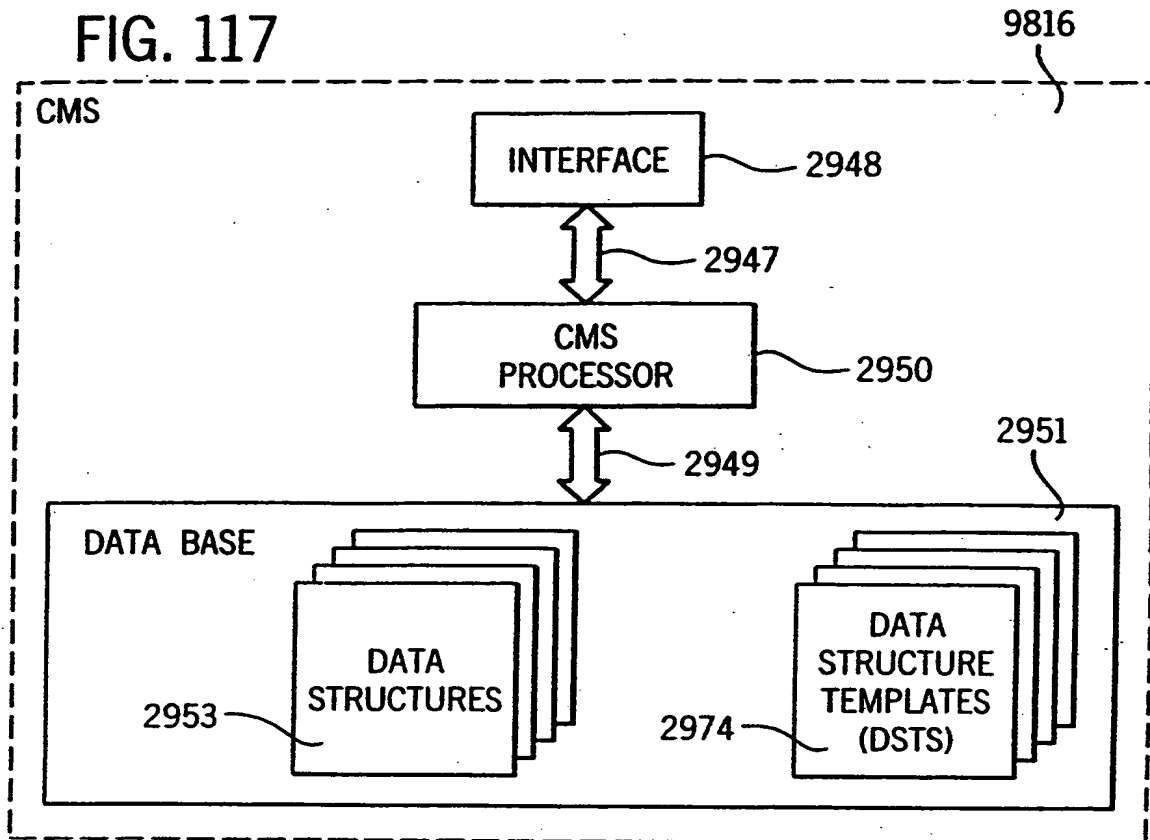


FIG. 118

